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PTO/SB/21 (08-00)
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U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/911,024
Filing Date	24 July 2001
First Named Inventor	Stephen M. REUNING et al.
Group Art Unit	3629
Examiner Name	Jon. OUELLETTE
Total Number of Pages in This Submission	
Attorney Docket Number	Diedre

ENCLOSURES *(check all that apply)*

- [x] Fee Transmittal Form
  - [x] Fee Attached
- [ ] Amendment / Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [x] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Assignment Papers *(for an Application)*
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
- [ ] After Allowance Communication to Group
- [x] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to Group (*Appeal Notice, Brief, Reply Brief*)
- [ ] Proprietary Information
- [ ] Status Letter
- [ ] Other Enclosure(s) *(please identify below)*:

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Pharmaceutical Patent Attorneys, LLC 55 Madison Avenue, 4th floor, Morristown NJ 07960-7397 USA
Signature	
Date	See below date

CERTIFICATE OF MAILING

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Signature		Date	~~28 Apr 04~~ 28April04

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AF/3629

PTO/SB/17 (10-01)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FEE TRANSMITTAL for FY 2002

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT ($) 375.00

Complete if Known	
Application Number	09/911,024
Filing Date	24 July 2001
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METHOD OF PAYMENT

1. ☐ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:
   Deposit Account Number
   Deposit Account Name
   ☐ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17
   ☐ Applicant claims small entity status. See 37 CFR 1.27
2. ☑ **Payment Enclosed:**
   ☐ Check ☑ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	740	201	370	Utility filing fee	770.00
106	330	206	165	Design filing fee	0.00
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	0.00

SUBTOTAL (1) ($) 0.00

2. EXTRA CLAIM FEES

		Extra Claims		Fee from below	Fee Paid
Total Claims	14	-20** =	0	X 9.00	= 0.00
Independent Claims	3	- 3** =	0	X 42.00	= 0.00
Multiple Dependent				0.00	= 0.00

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 0.00

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

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3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	0.00
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	0.00
139	130	139	130	Non-English specification	0.00
147	2,520	147	2,520	For filing a request for *ex parte* reexamination	0.00
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	0.00
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	0.00
115	110	215	55	Extension for reply within first month	0.00
116	400	216	200	Extension for reply within second month	210.00
117	920	217	460	Extension for reply within third month	0.00
118	1,440	218	720	Extension for reply within fourth month	0.00
128	1,960	228	980	Extension for reply within fifth month	0.00
119	320	219	160	Notice of Appeal	0.00
120	320	220	160	Filing a brief in support of an appeal	165.00
121	280	221	140	Request for oral hearing	0.00
138	1,510	138	1,510	Petition to institute a public use proceeding	0.00
140	110	240	55	Petition to revive - unavoidable	0.00
141	1,280	241	640	Petition to revive - unintentional	0.00
142	1,280	242	640	Utility issue fee (or reissue)	0.00
143	460	243	230	Design issue fee	0.00
144	620	244	310	Plant issue fee	0.00
122	130	122	130	Petitions to the Commissioner	0.00
123	50	123	50	Processing fee under 37 CFR 1.17(q)	0.00
126	180	126	180	Submission of Information Disclosure Stmt	0.00
581	40	581	40	Recording each patent assignment per property (times number of properties)	0.00
146	740	246	370	Filing a submission after final rejection (37 CFR § 1.129(a))	0.00
149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))	0.00
179	740	279	370	Request for Continued Examination (RCE)	0.00
169	900	169	900	Request for expedited examination of a design application	0.00
Other fee (specify)					0.00

*Reduced by Basic Filing Fee Paid **SUBTOTAL (3)** ($) 375.00

SUBMITTED BY				Complete (if applicable)	
Name (Print/Type)	Mark POHL	Registration No. (Attorney/Agent)	35,325	Telephone	(973) 984-0076
Signature				Date	26 April 04

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Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

#13
5.12.04
Walden

IN THE UNITED STATES PATENT OFFICE

Ex parte Stephen Michael REUNING *et al.*	App. Serial No.: 09/911,024 Appeal No. : 2004-_____ **APPEAL BRIEF**

This APPEAL BRIEF is submitted in response to the 23 Jan. 2004 NOTICE OF APPEAL.

1 REAL PARTY IN INTEREST

The real party in interest is the assignee, Diedre Moire Corporation.

2 RELATED APPEALS AND INTERFERENCES

There are no related interferences which will directly affect nor be directly affected by nor have a bearing on the Board's decision in this appeal.

This case is a continuation-in-part of Serial Number 09/897,826, which case is also subject to a pending appeal. Applicant requests the Board consider hearing both appeals at the same time, to avoid promulgating conflicting factual findings in the two cases.

3 STATUS OF CLAIMS

Claims 1-66 are pending.

Claims 1-11; 13-25; 33-44; 45-58 and 66 stand rejected under 35 USC 103(a) as obvious over MOSSBERG, Wall Street Journal (24 Oct. 1996) combined with HARTMAN *et al.*, U.S. Letters Patent No. 5,758,324 (26 May 1998)[1] and BOGURAEV, U.S. Letters Patent No. 5,799,268 (25 Aug. 1998).

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[1] The OFFICE ACTION (30 Dec. 2003) at page 2, ¶ 4, says "Hartman et al. (US 2002/0111958 A)." This appears to be a typographical error. First, while HARTMAN's issued patent is of record, his published continuation

Claims 12 and 45 stand rejected under 35 USC 103 as obvious over MOSSBERG combined with HARTMAN and BOGURAEV.

Claims 26-32 and 59-65 stand rejected under 35 USC 103(a) as obvious over MOSSBERG combined with HARTMAN and PEACH, U.S. Letters Patent No. 5,321,604 (14 June 1994).

4 STATUS OF AMENDMENTS

There are no pending claim amendments.

5 SUMMARY OF INVENTION

5.1 Summary of the Invention

The claimed invention relates to a new way to compile a database of direct-marketing sales prospects.

Direct marketing (*e.g.*, direct mail and telemarketing) is well known. Direct marketing, of course, requires a database of sales prospects.

Professional recruiting using resumes is similarly well known. Until now, however, resumes have been used simply for professional recruiting.

The inventors have realized that resumes, because they contain detailed professional profiles, are useful in compiling a direct marketing database. This database is especially useful in direct-mail campaigns for technical or professional products. Compiling such a database, however, has proven extremely labor intense. Perhaps this is why no one has yet used resumes to make a direct marketing sales prospect database.

The inventors found a way. The system can for convenience be thought of as involving two general parts: (1) compiling a data base of candidate contact information, and (2) using this data as the variable inputs in a mail merge to create a customized advertisement delivered to the specific candidate. How the claimed invention does this is described in the SPECIFICATION.

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application Serial No. US 2002/0111958 A, is not. Sec nd, the OFFICE ACTION cites to HARTMAN by column and line number ("C5, L25-65") as seen in an issued patent, rather than citing to paragraph numbers as seen in a published application. Because the published application is a continuation of the issued patent, I assume the disclosures are identical, so the difference between the two documents is not material to this appeal.

For the first part, data comprising professional profiles (*e.g.*, resume or curriculum vitae data) are collected and stored in a data structure (or "database"). *See* SPECIFICATION at page 11, lines 21 *et seq*. Four professional profile collection strategies are described. Id. One involves harvesting Personal Profiles from the Internet and is described in Steps 1200 through 1370. Id. Another involves collecting contact data from third party sources such as data suppliers, resume collection website companies, etc., and is described in Steps 1400 through 1430. Id. Another collection strategy involves collecting professional profiles via a collection program placed on websites such as community portals and is described in Steps 1600 through 1640. Id. Another collection strategy involves collecting professional profiles as a response to conventional help wanted advertising in such mediums as newspapers, trade journals, and Internet job posting websites and is described in Steps 1800 through 1850. Id.

5.2 How the Claims Describe the Invention

This aspect of the invention is described in the claims. Independent claim 1[2] is drawn to a method of constructing a "mailing list" of sales prospects:

> 1. A method for harvesting professional profiles, the method comprising:
> a. Searching the Internet,
> b. Identifying web pages and Internet postings containing professional profile data,
> c. Collecting said professional profile data,
> d. Identifying in said professional profile text strings constituting contact information data, and
> e. Storing said Professional Profile and said contact information data into a data structure.

Thus, claim 1 requires five elements, each one of which is known in the art. These five known elements, however, are put together to make a new combination. This new combination achieves a result qualitatively superior to that achievable using prior art approaches.

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[2] For the convenience of the Board, I have inserted line numbers "a" to "e" in the claim shown here. The actual claims (shown in the Appendix) do not have line numbers.

6 THE ISSUES PRESENTED

Whether the OFFICE ACTION shows that claims 1-11; 13-25; 33-44; 46-58 and 66 are obvious in light of MOSSBERG combined with HARTMAN and BOGURAYEV?

Whether the OFFICE ACTION shows that claims 12 and 45 are obvious in light of MOSSBERG combined with HARTMAN and BOGURAYEV?

Whether the OFFICE ACTION shows that claims 26-32 and 59-65 are obvious in light of MOSSBERG combined with HARTMAN and PEACH?

7 THE REFERENCES RELIED ON BY THE EXAMINER

The rejections are based on the following references:

7.1 MOSSBERG (1996)

Walter S. MOSSBERG, *Threats to Privacy On-Line Become More Worrisome*, The Wall Street Journal page B1 (24 Oct. 1996) discusses threats to privacy on-line.

7.2 HARTMAN (1998)

Richard L. HARTMAN *et al.*, United States Letters Patent No. 5,758,324, teaches a resume database. Data is input into the HARTMAN database using resumes and a variety of template forms, as shown in HARTMAN at Figs. 3, 4.

7.3 BOGURAYEV (1998)

Branimir K. BOGURAEV, U.S. Letters Patent No. 5,799,268, teaches an automated method for compiling a software technical assistance database.

7.4 PEACH (1994)

John A. PEACH *et al.*, United States Letters Patent No. 5,321,604, teaches an "Apparatus and Process for Administering Promotional Mailing" useful "for merging promotional information, based on multiple requests and relating to different promotions, into a single stream for the printing and mailing of coupons, checks or other promotional items."

8 GROUPING OF CLAIMS

The OFFICE ACTION raises three distinct obviousness rejections against three distinct groups of claims. Applicant does not object to the Examiner's grouping of separately patentable claims.

9 ARGUMENT

The OFFICE ACTION says the claims define obvious combinations of the cited references. Applicant respectfully disagrees; the claimed combinations are in no way obvious, and the OFFICE ACTION itself presents evidence showing this. The Board should reverse all the rejections for this reason.

If the Board finds the combinations are obvious, however, then for this reason - that the combinations are obvious - the Board must ***reverse*** all the rejections as a matter of law.

We address MOSSBERG and HARTMAN first, as they are essential to each rejection, and share certain shortcomings. We then discuss BOGURAYEV and PEACH.

10 MOSSBERG (1996)

Walter S. MOSSBERG, *Threats to Privacy On-Line Become More Worrisome*, The Wall Street Journal page B1 (24 Oct. 1996) discusses threats to privacy on-line. The OFFICE ACTION cites to the following part of MOSSBERG:

> There are some situations developing on the Web in which information about you might be made available without your permission or voluntary action. There are at least three forms of this involuntary publication of which I'm aware. One, called "mining," involves using automated software to scoop up your e-mail address from public discussion groups in which you have participated and then publishing it on directory sites where anybody can retrieve it. A second practice involves companies trying to capture your "click stream," which is the history of what you choose to view on the Web, to ascertain your likes and dislikes and create a profile that can be sold to marketers.
>
> The third technique involves publishing on the Web various government and other databases, such as Social Security or auto-registration data.

MOSSBERG at ¶ ¶ 8-9.

MOSSBERG cannot make the claims obvious (1) because Applicant antedates MOSSBERG; (2) because MOSSBERG fails to enable the claimed limitation, and (3) because MOSSBERG fails to suggest combining the references.

10.1 Applicant antedates Mossberg

10.1.1 Applicant Has Established Antedating Possession of both elements allegedly taught by MOSSBERG

Applicant antedates MOSSBERG alone, because Applicant has established prior possession of both limitations allegedly taught by MOSSBERG. Applicant antedates MOSSBERG in obvious combination with any other reference, because antedating possession carries with it possession of obvious combinations thereof.

10.1.1.1 Applicant Antedates MOSSBERG alone

This application is a continuation-in-part of parent application Serial No. 08/984,650, filed 12 December 1996. In the parent case, Applicant filed a RULE 1.131 DECLARATION (14 July 2000) (copy enclosed).

The Office accepted this DECLARATION. This is because in the first responsive Office Action, the examiner must point out every deficiency in the declaration. *See* MANUAL OF PATENT EXAMINING PROCEDURE § 602.03 (2003). Here, after Applicant submitted the DECLARATION, the Office did not point out any deficiency in it; to the contrary, the Office withdrew the rejections based on the reference antedated by the DECLARATION. *See* OFFICE ACTION page 3-9 (24 Oct. 2000). The Office thus appears to have accepted this DECLARATION without objection.

This DECLARATION establishes that not later than 10 Sept. 1996 (six weeks before MOSSBERG's 24 October 1996 publication date), Applicant possessed at least two of the five claim limitations recited in pending claim 1.[3]

The OFFICE ACTION alleges that both of the claim limitations possessed by Applicant not later than 10 Sept. 1996 ("Searching the Internet" and "Identifying web pages and Internet postings containing professional profile data") are taught by MOSSBERG. *See* OFFICE ACTION (17 Dec 2003) at 3, ¶ 7.

Because the DECLARATION shows prior possession of each of the limitations allegedly taught by MOSSBERG, the DECLARATION overcomes MOSSBERG as a reference.

10.1.1.2 Applicant antedates MOSSBERG combined with any other reference

The OFFICE ACTION does not, however, cite MOSSBERG alone, but in combination with other references. Here, Applicant may overcome a rejection based on a combination of references by showing possession of the invention as a whole prior to the effective date of any one of the references; applicant need not antedate the reference with the earliest filing date. MANUAL PAT. EXAM. PROC. § 715.02 (Aug. 2001).

Here, Applicant has antedating possession of the invention as a whole. The OFFICE ACTION itself says this. This is because possession of a claim element(s) carries with it possession of obvious variations and combinations thereof. In re Spiller, 500 F.2d 1170, 182 U.S.P.Q. 614 (C.C.P.A. 1974); In re Stryker, 435 F.2d 1340, 168 U.S.P.Q. 372 (C.C.P.A.1971).

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[3] The DECLARATION establishes that Applicant possessed each of the elements of Serial No. '650, independent claim #5. Certain elements of Serial No. '650 claim 5 and certain elements of pending claim 1 are shown in the table :

Serial No. '024 Claim #1	Serial No. '650 claim #5
Searching the Internet	Searching the Internet
Identifying web pages and Internet postings containing professional profile data	reading at least part of the text of said internet page or web posting; comparing said text against at least one user defined criteria for an individual with specifically defined experiences, interests, capabilities, professional titles, talents or the like
Identifying in said professional profile text strings constituting contact information data	Extracting from said Internet page or web posting an e-mail address

In the immediate case, the OFFICE ACTION concedes that the various claim limitations not expressly taught by MOSSBERG are mere obvious combinations thereof. *See, e.g.,* OFFICE ACTION (24 Sept. 2002) (copy enclosed) at ¶¶ 32, 37, 12. By saying that the claims as a whole are merely obvious variations on MOSSBERG, the OFFICE ACTION acknowledges that the Applicant possessed the claims as a whole no later than the DECLARATION date.

In rebuttal, the OFFICE ACTION says, "one cannot show nonobviousness by attacking references individually where the rejections are based on combinations." As authority, the OFFICE ACTION cites In re Keller, 642 F.2d 413 (CCPA 1981) (copy enclosed) and In re Merck & Co., 800 F.2d 1091 (Fed. Cir. 1986) (copy enclosed). The cases, however, actually say something quite different.

In Merck, "the Board *reversed* the section 102 rejection because the effective filing date of *the application antedated all the references* cited therein." Merck, 800 F.2d at 1093 (emphasis added). After eliminating these unavailable references, the Federal Circuit then turned to addressing "whether [the] invention would have been *prima facie* obvious over the available prior art of record." Id. at 1095-96 (emphasis added). In Merck (unlike in the immediate case), the applicant conceded that each reference used in the section 103 rejections was available as prior art.

Similarly, In re Keller, did not involve an applicant "attacking references individually" as being unavailable. Rather, Keller involved references which were conceded to be available as prior art. In Keller, the applicant simply debated the factual adequacy of the express suggestions to combine recited in the references. *See* In re Keller, 642 F.2d at 422 (applicant's affidavit "concerns itself mainly with the question of whether the Walsh et al article suggest (sic) the use of digital timing").

Neither Keller nor Merck says that the Office can reject claims over an unavailable reference. Applicant has antedating possession of at least two claim limitations and obvious variations thereof, thus possession of the claims as a whole. Thus, all rejections based in whole or in part on MOSSBERG must be withdrawn. Applicant respectfully notes that this result is an issue of law, not a finding of fact. As such, regardless of the Examiner's (or the Board's) factual

patentability of the pending claims, so there is a controversy. I understand, however, the Examiner to mean not that the issue is "moot" in the legal sense, but rather that he simply refuses to consider the issue at all.

The Examiner's refusal to consider this issue is respectfully believed improper. This is because, while the Commissioner of Patents has "some discretion" in administering the agency, refusing to hear the issue at all is not within the discretion of the Commissioner. To the contrary, it is the exact opposite - it is a refusal by the Commissioner to exercise any discretion at all. *See* Steinmetz v. Allen, 192 U.S. 543, 560-61 (1904) (refusal to hear appeal "is not the exercise of [administrative] discretion; it is a determination not to hear. No inventor can reach the point of invoking the discretion of the Patent Office. He is notified in advance that he will not be heard, no matter what he might be able to show. His right is denied, therefore; not regulated.").[4] The Examiner's refusal to hear and respond to this issue is thus respectfully believed outside the discretion of the Patent Office.[5]

10.2 MOSSBERG does not enable the claim limitations

A reference cannot render obvious a claim if the reference does not enable the claimed limitation. Ashland Oil Inc. v. Delta Resins & Refactories, Inc., 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1985), *cert. denied*, 475 U.S. 1017.

Here, the OFFICE ACTION says, "Mossberg discloses a method for harvesting professional profiles, the method comprising ... Identifying web pages ... containing profile data." OFFICE ACTION (17 Dec. 2003) at page 3, ¶ 7.

MOSSBERG, however, fails to enable. MOSSBERG simply says that someone is "trying to capture your 'click stream'" and someone else is "publishing on the Web various government and other databases." MOSSBERG does not provide an enabling disclosure of *how* a user can "Identify[] web pages and Internet postings containing professional profile data."

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[4] In Steinmetz, the patent examiner issued a final rejection, and Steinmetz filed an Appeal. The examiner, however, "refused to answer the appeal and to forward the [appeal brief] with his answer thereto" to the Board of Appeals. Id. at 547. The Supreme Court held that a patent applicant has a statutory right to have his appeal heard, id. at 556, and ordered the Commissioner to hear the appeal.

[5] I note that Examiner OUELLETTE has provided an exceptionally thorough and thoughtful analysis of the references; I thus am somewhat surprised at the Examiner's reluctance to consider the DECLARATION.

This is not surprising, because MOSSBERG is just a newspaper article, not a patent nor a technical white paper. MOSSBERG thus fails to enable the claimed limitation.

Applicant thus said, "If the Examiner believes MOSSBERG enables the limitations, the Examiner is invited to provide an AFFIDAVIT OF REFERENCES introducing into the record documentary evidence proving that MOSSBERG would have enabled practicing the limitation at the time the claimed invention was made." AMENDMENT (8 April 2003) at page 5, note 1. The Examiner has not provided an AFFIDAVIT OF REFERENCES explaining how MOSSBERG alone, or combined with the level of skill in the art, would have enabled the limitation at the time the invention was made. Thus, the Examiner is respectfully believed required to withdraw MOSSBERG as a reference. See In re Eynde, 178 USPQ 470, 474 (C.C.P.A. 1973) ("If evidence of the knowledge possessed by those skilled in the art is to be properly considered, it must be timely injected into the proceedings"); In re Ahlert, 165 USPQ 418, 420 (C.C.P.A. 1970); Relying on judicial notice of what a skilled artisan would envision is reversible error. Ex parte Nouel, 158 USPQ 237 (B.P.A.I. 1967). Without the AFFIDAVIT OF REFERENCES, MOSSBERG must be withdrawn as a matter of law, regardless of what MOSSBERG specifically teaches.

10.3 All rejections based in whole or in combination with MOSSBERG must be reversed

All rejections based on MOSSBERG must be reversed as a matter of law because Applicant antedates MOSSBERG and because MOSSBERG fails to enable the claimed limitation.

11 HARTMAN

11.1 HARTMAN

Recall the language of the claims; claim 1 describes a method with several steps:

a. Searching the Internet,

b. Identifying web pages and Internet postings containing professional profile data,

c. Collecting said professional profile data,

d. Identifying in said professional profile text strings constituting contact information, and

e. Storing said ... data into a data structure.

This is an automated method to construct a mailing list of direct-marketing contacts. In contrast, HARTMAN teaches a "Resume Storage and Retrieval System."

The two systems differ in important aspects. Perhaps the most important of these is that in HARTMAN, job seekers submit resumes to the system administrator, while in Applicant's method, the system administrator can proactively seek out data on people, without requiring resumes (indeed, without requiring any data at all) to be submitted to the system.

This difference is pointed out in the OFFICE ACTION, which correctly notes that HARTMAN fails to teach steps a, b or d. OFFICE ACTION (17 Dec. 2003) at page 3, ¶¶ 6, 8. The OFFICE ACTION alleges that HARTMAN discloses "Collecting [] professional profile data" and "Storing [] Professional Profile and [] contact information data into a data structure." Id. at page 2, ¶ 5.

11.2 The OFFICE ACTION fails to plead a *prima facie* case

The OFFICE ACTION alleges that HARTMAN discloses "Collecting [] professional profile data" and "Storing [] Professional Profile and [] contact information data into a data structure." Id. at page 2, ¶ 5. This is not, however what the claims require.

The claims do not require "collecting [] professional profile data"; the claims require "collecting *said* professional profile data." That means, collecting professional profile data contained in web pages and Internet postings.

Similarly, the claims do not require "Storing [] Professional Profile and [] contact information data into a data structure." Rather, the claims require "storing *said* Professional Profile and *said* contact information." That means, storing professional profile data which has been collected from web pages and Internet postings.

The OFFICE ACTION fails to allege that HARTMAN teaches collecting professional profile data contained in web pages and Internet postings. The OFFICE ACTION thus fails to

allege HARTMAN teaches claim limitations c and e. Because the OFFICE ACTION fails to allege that HARTMAN teaches these claim limitations, it fails to plead a *prima facie* case.

11.3 HARTMAN teaches an expectation of failure

A *prima facie* case requires the art of record teach a reasonable expectation of success in making the combination. In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991). Here, HARTMAN teaches a reasonable expectation of failure. HARTMAN teaches a system which requires the user to input data in a fillable form:

> During the session, the server 12 communicates to the applicant's client machine a resume outline form 30 (FIG. 3) to be completed by a job applicant. The form 30 has a plurality of fields 31 relevant to employment, using which typical information found on a resume is summarized by the applicant. The form 30 has fields that are similar to blanks found on traditional job application forms available from employers.

HARTMAN at col. 5, lines 25-34. Upon receiving this form, the job applicant fills in as many fields as desired. Id. at col. 6, lines 8-14. In HARTMAN, the applicant's name and contact information is not "mined" from the internet; to the contrary, HARTMAN says that manually inputting this data into the database is "mandatory." Id.

Furthermore, HARTMAN admonishes that it should not be combined with MOSSBERG (nor with BOGURAYEV). HARTMAN says that automated data mining (per MOSSBERG and BOGURAYEV) does not work:

> Still other attempts have employed the aforementioned OCR conversion to allow the use of "keyword" search methods on the resulting text full of resumes, in an attempt to find those which contain key words or phrases. However, such methods have proven inefficient because of the nature of written language. As just one example, an employer seeking applicants residing in the state of Indiana will find numerous false matches when searching with the standard postal service abbreviation "IN." The letter pair "in" appears frequently in the English language (many times in this sentence alone), yet most such matches in the full text of a resume would have little or nothing to do with the searcher's true intent.
>
> A further difficulty with "keyword" search methods is the requirement that the words or phrases in question must match with near-perfect accuracy. The diversity of job applicant writing skills and vocabularies causes many resumes, which otherwise might describe applicants with similar attributes, to be written

> using very different terms and phrases. Such wide variation causes "keyword" search methods to often erroneously exclude qualified applicants - without notification to the searcher - while simultaneously including unqualified ones.

HARTMAN at col. 1, line 59 to col. 2, line 14. HARTMAN thus teaches his system precludes using automated search methods. Rather, HARTMAN says that this data must be input by the users, rather than "mined" from online documents. *E.g.*, id. at col. 5, lines 25-33; col. 6 lines 26-47; col. 6, lines 8-14, 59-67. HARTMAN says that automated data mining technology will not work at all, or will work badly and generate "outdated information and questionable results":

> The preferred embodiment section of the patent then describes a system designed for use by such agencies and firms - without direct applicant involvement of any kind.
>
> Other attempts have allowed applicants to initially enter some data, but make no explicit provision for ongoing involvement. Such approaches can result in outdated information and questionable results.

HARTMAN at col. 2, line 26-34. HARTMAN goes to great lengths to specify that the system requires not catholic web content, but *resumes*. *E.g.*, id. at col. 6, lines 8-14, lines 26-47.

HARTMAN teaches away from using MOSSBERG (or BOGURAYEV), or any other keyword search technology. Because it is improper to combine references where the references teach away from their combination, In re Grasselli, 713 F.2d 731, 743 (Fed. Cir. 1983), HARTMAN cannot be combined with MOSSBERG (nor with BOGURAYEV).

11.4 HARTMAN lacks any suggestion to make the combination.

A *prima facie* case of obviousness requires some suggestion to make the combination. This suggestion or motivation must be recited in the references. In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991).

Here, the OFFICE ACTION asserts that the claimed combination has "the advantage of providing a method of collecting professional profile data, with the ability to increase effectiveness and customer reach, by obtaining profile data directly from the internet through, the use of data harvesting capabilities." OFFICE ACTION (17 Dec. 2003) at ¶¶ 10, 35, 49, 50; see also OFFICE ACTION (24 Sept. 2002) at ¶¶ 12, 37. This advantage of the combination, however, is

alleged by the Examiner; it is not recited in any reference of record. A motivation to combine must be shown somewhere *in the references of record*, not raised as a personal observation by the Examiner.[6] The OFFICE ACTION does not show where in any reference of record this advantage was recognized by the person of skill in the art at the time the invention was made. Thus, the OFFICE ACTION has not pled a *prima facie* case of obviousness.

11.5 Secondary indicia of non-obviousness

Synergistic effectiveness indicates non-obviousness. Here, the OFFICE ACTION asserts that the claimed combination has "the advantage of providing a method of collecting professional profile data with internet data harvesting capabilities." OFFICE ACTION at ¶¶ 12, 37 (24 Sept. 2002). The OFFICE ACTION argues that the claimed combination has is a synergistic advantage *vis* the art of record. Such synergistic effectiveness indicates the claimed combination is *non*-obvious.

Similarly, for claims 12 and 45, the OFFICE ACTION asserts that an advertising message "does not functionally relate to the steps in the method claimed." OFFICE ACTION at ¶ 32 (24 Sept. 2002). This factual assertion supports the *non*-obviousness of the contested claim.

12 BOGURAYEV

12.1 Bogurayev

BOGURAYEV teaches a "method involving computer-mediated linguistic analysis of online technical documentation to extract and catalog from the documentation knowledge essential to, for example, crating a online help database." Id. at Abstract. BOGURAEV explains:

> The present invention describes a method involving computer-manipulated linguistic analysis of online technical documentation for automatically generating a catalog of pertinent information defining, in a concise formal structure, the

[6] Put another way, perhaps it would be obvious for Examiner Ouellette to combine these references, and perhaps back in 1996 it would have been obvious for him to have combined them; this would not surprise me, as the Examiner appears exceptionally intelligent. The legal standard is not, however, what Mr. Ouellette would have thought of in 1996, but what the average person of skill in the art would have thought of.

> domain, i.e., the topic or application about which the online documentation provides detailed background information.

Id. at col. 6, line 64 to col. 7, line 5.

While the method works with software technical documentation, BOGURAEV cautions that this approach does not work with other kinds of documentation:

> Technical documents represent a well defined genre of text, sharing common features of style, form, content and presentation. As will be seen, acknowledging and accounting for such expository features found in such documentation allows for certain types of linguistic analysis to be applied in a particular way to map the text of a document onto a concise, formal structure of linguistic objects representative of the key terms and their properties, as well as the relations (i.e., actions) between them, found in the domain to which the documentation is directed.

Id. at col. 9, lines 1-10. BOGURAYEV does not support an obviousness rejection for the following reasons.

12.2 Bogurayev is from a non-analogous art

An obviousness combination cannot rely on a reference from a non-analogous art. For example, single inline memory modules (SIMM) of varying sizes for industrial computers, is not analogous art *vis* claims for SIMMs of modular size for personal computers. Wang Laboratories, Inc. v. Toshiba Corp., 993 F.2d 858, 26 U.S.P.Q. 1767 (Fed. Cir. 1993).

Here, BOGURAYEV is non-analogous art. BOGURAYEV addresses online software technical documentation, not user-entered professional profile resume information as in HARTMAN. BOGUURAYEV addresses online software documentation only, saying that it works only with software documentation, because software documentation is a "well defined genre of text, sharing common features of style, form, content and presentation." Id. at col. 9, lines 1-3. In contrast, the claimed invention works with catholic online text, having widely varied "features of style, form, content and presentation."

Because BOGURAYEV itself says it is in a non-analogous art, an art used to process non-analogous data, BOGURAYEV cannot be used for an obviousness rejection.

12.3 Bogurayev teaches an expectation of failure

A *prima facie* case of obviousness requires the art of record teach a reasonable expectation of success in making the combination. In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991). Here, BOGURAYEV teaches a reasonable expectation of failure. BOGURAYEV teaches an approach that works only when the online content is a "well defined genre of text, sharing common features of style, form, content and presentation." Id. at col. 9, lines 1-3. In so doing, BOGURAYEV teaches away from using his system with a diverse set of online documents which do not make any "well defined genre of text, sharing common features of style, form, content and presentation." BOGURAYEV thus teaches a reasonable expectation of *failure*, not success, when used with catholic, diverse online content.

Because BOGURAYEV teaches a reasonable expectation of failure (not success), it cannot support an obviousness rejection. The Examiner was requested to provide an AFFIDAVIT OF REFERENCES introducing into the record documentary evidence proving that the BOGURAYEV system would work with the broad range of online content discussed in the application. The Examiner has failed to do so. Thus, the rejection based on BOGURAYEV must be withdrawn as a matter of law. *See* Section 10.2, *supra*.

12.4 BOGURAYEV lacks any suggestion to make the combination.

A *prima facie* case of obviousness requires some suggestion to make the combination. This suggestion or motivation must be recited in the references. In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991).

Here, the OFFICE ACTION asserts that the claimed combination has "the advantage of providing a method of collecting professional profile data, with the ability to increase effectiveness and customer reach, by obtaining profile data directly from the internet through, the use of data harvesting capabilities." OFFICE ACTION (17 Dec. 2003) at ¶¶ 10, 35, 49, 50; see also OFFICE ACTION (24 Sept. 2002) at ¶¶ 12, 37. This advantage of the combination, however, is alleged by the Examiner; it is not recited in any reference of record. A motivation to combine must be shown somewhere *in the references of record*, not raised as a personal observation by

the Examiner.[7] The OFFICE ACTION does not show where in any reference of record this advantage was recognized by the person of skill in the art at the time the invention was made. Thus, the OFFICE ACTION has not pled a *prima facie* case of obviousness.

13 PEACH

13.1 PEACH lacks any suggestion to make the combination.

A *prima facie* case of obviousness requires some suggestion to make the combination. This suggestion or motivation must be recited in the references. In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991).

Here, the OFFICE ACTION asserts that the claimed combination has "the advantage of providing a method of collecting professional profile data, with the ability to increase effectiveness and customer reach, by obtaining profile data directly from the internet through, the use of data harvesting capabilities." OFFICE ACTION (17 Dec. 2003) at ¶¶ 10, 35, 49, 50; see also OFFICE ACTION (24 Sept. 2002) at ¶¶ 12, 37. This advantage of the combination, however, is alleged by the Examiner; it is not recited in any reference of record. A motivation to combine must be shown somewhere *in the references of record*, not raised as a personal observation by the Examiner.[8] The OFFICE ACTION does not show where in a reference of record this advantage was recognized by the person of skill in the art at the time the invention was made. Thus, the OFFICE ACTION has not pled a *prima facie* case of obviousness.

14 SUMMARY

Applicant respectfully believes that: (1) the rejections should be withdrawn because the references cited do not establish a *prima facie* case of obviousness; and (2) the rejections must be withdrawn as a matter of law, as they rely on art antedated by the Applicant and art which fails to enable the claims.

Applicant notes this application is a continuation in part of a parent application (subject to a co-pending appeal) which was filed in 1996. Both cases are "special" due to granted

[7] See footnote 6.
[8] See footnote 6.

PETITIONS TO MAKE EXAMINATION SPECIAL and the substantial time since the application filing dates. The Board is respectfully requested to make a decision as promptly as is responsibly possible.

Further, since filing, the prosecution of these two cases has entailed nearly a dozen OFFICE ACTIONS, reviewing several scores of patent and non-patent references; these cases appear not likely to benefit from reopening examination.

A NOTICE OF APPEAL; and a FEE TRANSMITTAL FORM with the appropriate fees having been filed previously, please find enclosed (i) a PETITION FOR AN EXTENSION OF TIME; (ii) two additional copies of this APPEAL BRIEF, and (iii) a FEE TRANSMITTAL FORM with the appropriate fees.

Respectfully submitted,
PHARMACEUTICAL PATENT ATTORNEYS, LLC

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Enclosures

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OFFICE ACTION (24 Sept. 2002)

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SD:\Diedre\ 09.911,024 Appeal Brief (Apr. 04).doc

15 CLAIMS ON APPEAL

1. A method for harvesting professional profiles, the method comprising:

Searching the Internet,

Identifying web pages and Internet postings containing professional profile data,

Collecting said professional profile data,

Identifying in said professional profile text strings constituting contact information data, and

Storing said Professional Profile and said contact information data into a data structure.

2. The method of claim 1, wherein said contact information comprises an extractable e-mail address.

3. A method for normalizing data from a document containing professional profile data, the method comprising:

Obtaining said document,

Reading said document,

Identifying in said document text strings constituting contact information data, and

Storing said professional profile data and said contact information data into a data structure.

4. The method of claim 3, wherein said contact information comprises an extractable e-mail address.

5. The method of claim 3, further comprising:

Reading documents and combining to create a professional profile,

Identifying in said professional profile text strings constituting contact information data, and

Copying said professional profile and contact information data into a data structure.

6. The method of claim 3, further comprising:

Sorting the data in said data structure to identify profiles meeting a specified parameter, and

Merging said contact information with a pre-defined document template to create a personalized document.

7. The method of claim 3, wherein said professional profile is obtained by harvesting from the Internet.

8. The method of claim 3, wherein said professional profile is obtained from a third party source [selected from the group consisting essentially of data suppliers, resume collection website companies, and equivalents thereof].

9. The method of claim 3, wherein said professional profile is obtained via a professional profile collection program on a website.

10. The method of claim 3, wherein said professional profile is obtained as a response to help wanted advertising.

11. The method of claim 6, wherein said pre-defined document template can incorporate an electronic object.

12. The method of claim 11, wherein said pre-defined document template includes an advertising message.

13. Sorting a set of professional profiles to identify sales and advertisement prospects.

14. The method of claim 13, further comprising:

Obtaining a professional profile,

Identifying in said professional profile text strings constituting contact information data, and

Storing said Professional Profile and said contact information data into a data field or data fields in a data structure.

15. The method of claim 13, wherein said professional profile is obtained by harvesting from the Internet.

16. The method of claim 13, wherein said professional profile is obtained from a third party source [selected from the group consisting essentially of data suppliers, resume collection website companies, and equivalents thereof].

17. The method of claim 13, wherein said professional profile is obtained via a professional profile collection program on a website.

18. The method of claim 13, wherein said professional profile is obtained as a response to help wanted advertising.

19. A method for creating a list of sales or advertising prospects, the method comprising:

Obtaining professional profiles,

Storing said professional profiles in a data structure, and

Sorting to identify a subset of professional profiles stored in said data structure.

20. The method of claim 19, further comprising:

Exporting contact information data from said subset of professional profiles to create a list.

21. The method of claim 20, wherein said list may take the form of:

A printed list,

A digital file,

A delimited format file,

A format which causes a message to be delivered to each professional profile's contact, or

A merged document.

22. The method of claim 19, wherein said professional profile is obtained by harvesting from the internet.

23. The method of claim 19, wherein said professional profile is obtained from a third party source [selected from the group consisting essentially of data suppliers, resume collection website companies, and equivalents thereof].

24. The method of claim 19, wherein said professional profile is obtained via a professional profile collection program on a website.

25. The method of claim 19, wherein said professional profile is obtained as a response to help wanted advertising.

26. A method for advertising, the method comprising:

Selecting one or more items from a collection of computer stored images, computer stored text objects, computer stored audio objects, computer stored video objects, or other computer stored objects,

Combining said selections into a deliverable medium (advertisement),

Sorting professional profiles in a data structure, and

Merging contact information from said professional profiles into said deliverable medium.

27. The method of claim 26, further comprising:

Delivering said deliverable medium to prospects.

28. The method of claim 26 further comprising:

Printing said deliverable medium as a post card or letter

29. The method of claim 26, wherein said professional profile is obtained by harvesting from the internet.

30. The method of claim 26, wherein said professional profile is obtained from a third party source selected from the group consisting essentially of data suppliers, resume collection website companies, and equivalents thereof.

31. The method of claim 26, wherein said professional profile is obtained via a professional profile collection program on a website.

32. The method of claim 26, wherein said professional profile is obtained as a response to help wanted advertising.

33. A method of selecting advertisement and notice delivery addresses, the method comprising:

Searching a data structure containing professional profiles,

Identifying a subset of professional profiles,

Identifying in said professional profiles text strings constituting contact information data, and

Exporting said contact information data.

34. A system for harvesting professional profiles, the system comprising:

Searching the Internet,

Identifying web pages and Internet postings containing professional profile data,

Collecting said professional profile data,

Identifying in said professional profile text strings constituting contact information data, and

Storing said Professional Profile and said contact information data into a data structure.

35. The system of claim 34, wherein said contact information comprises an extractable e-mail address.

36. A system for normalizing data from a document containing professional profile data, the system comprising:

Obtaining said document,

Reading said document,

Identifying in said document text strings constituting contact information data, and

Storing said professional profile data and said contact information data into a data structure.

37. The system of claim 36, wherein said contact information comprises an extractable e-mail address.

38. The system of claim 36, further comprising:

Reading documents and combining to create a professional profile,

Identifying in said professional profile text strings constituting contact information data, and

Copying said professional profile and contact information data into a data structure.

39. The system of claim 36, further comprising:

Sorting the data in said data structure to identify profiles meeting a specified parameter, and

Merging said contact information with a pre-defined document template to create a personalized document.

40. The system of claim 36, wherein said professional profile is obtained by harvesting from the Internet.

41. The system of claim 36, wherein said professional profile is obtained from a third party source selected from the group consisting essentially of data suppliers, resume collection website companies, and equivalents thereof.

42. The system of claim 36, wherein said professional profile is obtained via a professional profile collection program on a website.

43. The system of claim 36, wherein said professional profile is obtained as a response to help wanted advertising.

44. The system of claim 39, wherein said pre-defined document template can incorporate an electronic object.

45. The system of claim 44, wherein said pre-defined document template includes an advertising message.

46. Sorting a set of professional profiles to identify sales and advertisement prospects.

47. The system of claim 46, further comprising:

Obtaining a professional profile,

Identifying in said professional profile text strings constituting contact information data, and

Storing said Professional Profile and said contact information data into a data field or data fields in a data structure.

48. The system of claim 46, wherein said professional profile is obtained by harvesting from the internet.

49. The system of claim 46, wherein said professional profile is obtained from a third party source [selected from the group consisting essentially of data suppliers, resume collection website companies, and equivalents thereof].

50. The system of claim 46, wherein said professional profile is obtained via a professional profile collection program on a website.

51. The system of claim 46, wherein said professional profile is obtained as a response to help wanted advertising.

52. A system for creating a list of sales or advertising prospects, the system comprising:

Obtaining professional profiles,

Storing said professional profiles in a data structure, and

Sorting to identify a subset of professional profiles stored in said data structure.

53. The system of claim 52, further comprising:

Exporting contact information data from said subset of professional profiles to create a list.

54. The system of claim 53, wherein said list may take the form of:

A printed list,

A digital file,

A delimited format file,

A format which causes a message to be delivered to each professional profile's contact, or

A merged document.

55. The system of claim 52, wherein said professional profile is obtained by harvesting from the internet.

56. The system of claim 52, wherein said professional profile is obtained from a third party source [selected from the group consisting essentially of data suppliers, resume collection website companies, and equivalents thereof].

57. The system of claim 52, wherein said professional profile is obtained via a professional profile collection program on a website.

58. The system of claim 52, wherein said professional profile is obtained as a response to help wanted advertising.

59. A system for advertising, the system comprising:

Selecting one or more items from a collection of computer stored images, computer stored text objects, computer stored audio objects, computer stored video objects, or other computer stored objects,

Combining said selections into a deliverable medium (advertisement),

Sorting professional profiles in a data structure, and

Merging contact information from said professional profiles into said deliverable medium.

60. The system of claim 59, further comprising:

Delivering said deliverable medium to prospects.

61. The system of claim 59 further comprising:

Printing said deliverable medium as a post card or letter

62. The system of claim 59, wherein said professional profile is obtained by harvesting from the internet.

63. The system of claim 59, wherein said professional profile is obtained from a third party source [selected from the group consisting essentially of data suppliers, resume collection website companies, and equivalents thereof].

64. The system of claim 59, wherein said professional profile is obtained via a professional profile collection program on a website.

65. The system of claim 59, wherein said professional profile is obtained as a response to help wanted advertising.

66. A system of selecting advertisement and notice delivery addresses, the system comprising:

Searching a data structure containing professional profiles,

Identifying a subset of professional profiles,

Identifying in said professional profiles text strings constituting contact information data, and

Exporting said contact information data.

US005758324A

United States Patent [19]

Hartman et al.

[11] Patent Number: 5,758,324

[45] Date of Patent: May 26, 1998

[54] **RESUME STORAGE AND RETRIEVAL SYSTEM**

[76] Inventors: **Richard L. Hartman**; **Mary M. Hartman**, both of 5205 N. Mulvaney Ct., Spokane, Wash. 99212; **Roy P. Massena**, P.O. Box 8435, Spokane, Wash. 99203

[21] Appl. No.: **597,359**

[22] Filed: **Feb. 8, 1996**

Related U.S. Application Data

[60] Provisional application No. 60/008,700 Dec. 15, 1995

[51] Int. Cl.[6] **G06F 17/60**

[52] U.S. Cl. **705/1**

[58] Field of Search 705/1, 11, 8, 9; 707/3, 104; 395/200.31-200.33, 200.47-200.49, 200.59; 345/438

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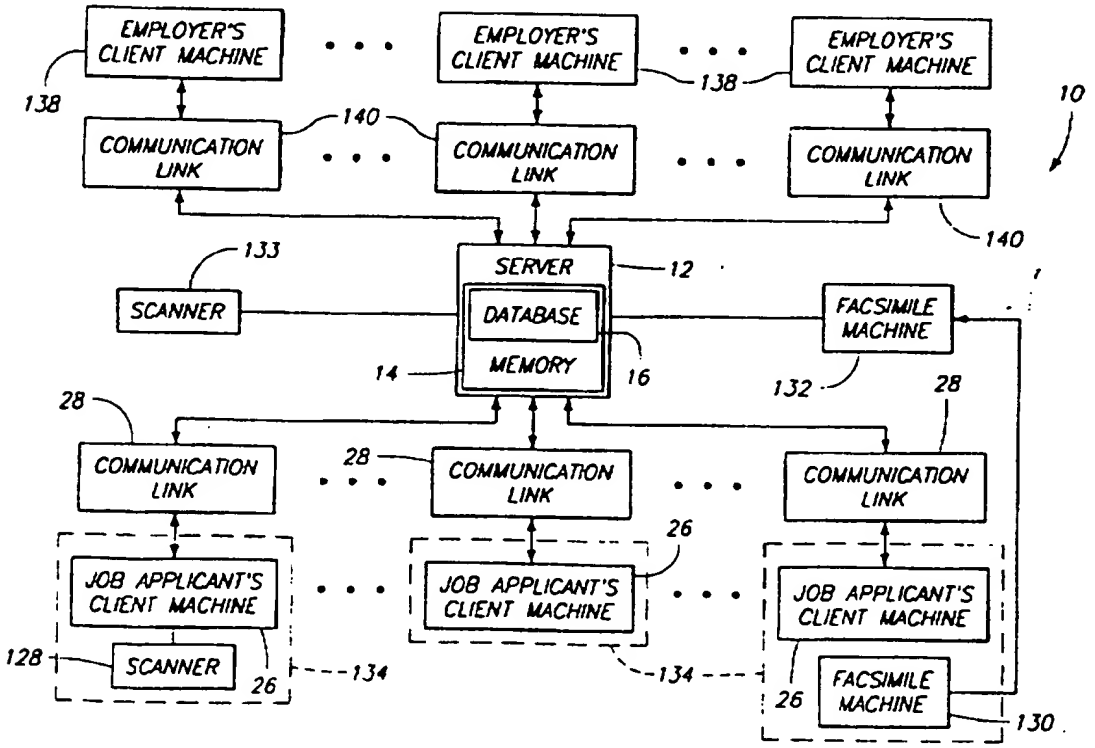
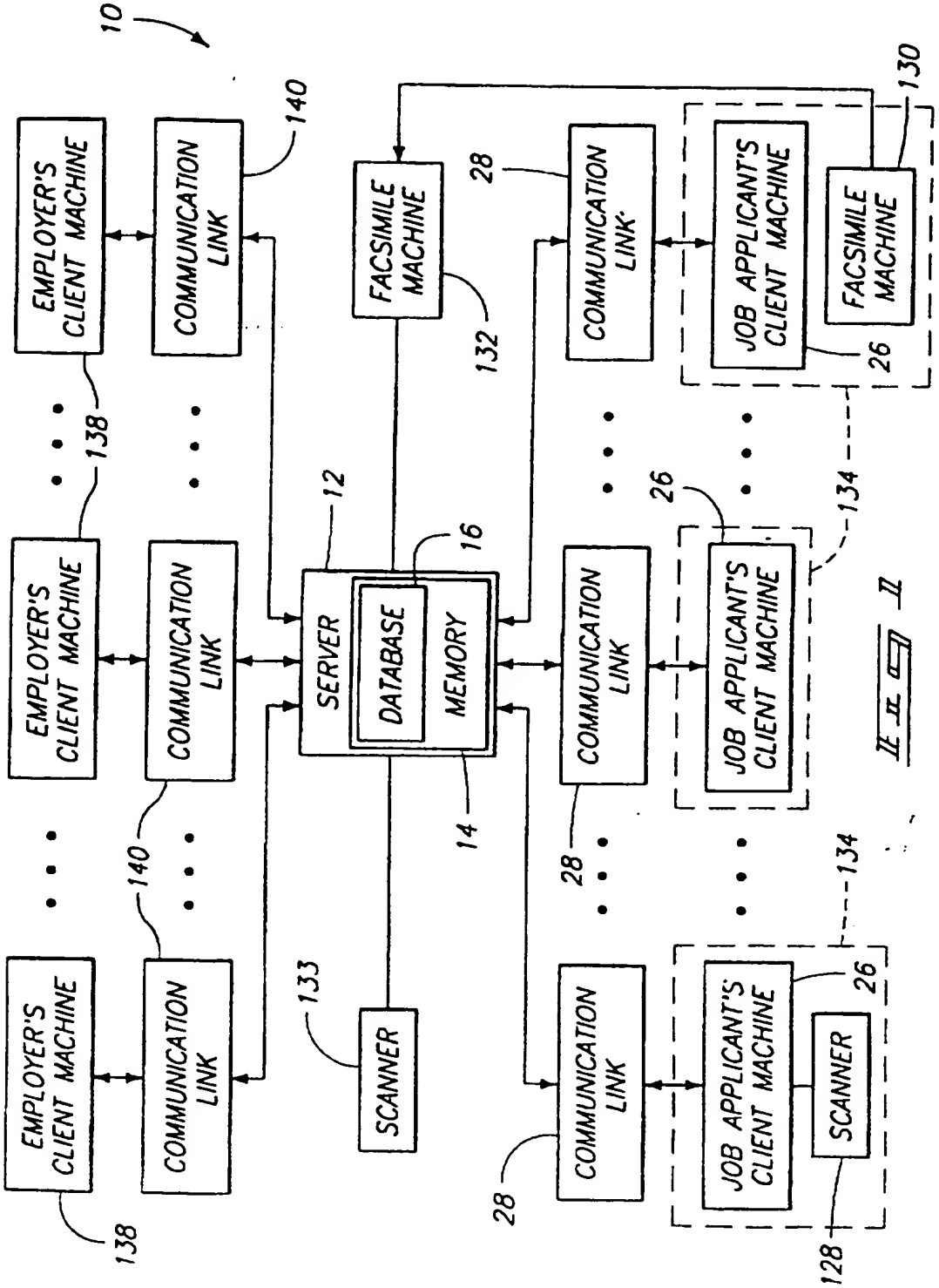
Primary Examiner—Gail O. Hayes
Assistant Examiner—Stephen Knuth
Attorney, Agent, or Firm—Wells, St. John, Roberts, Gregory & Matkin, P.S.

[57] **ABSTRACT**

A method of and apparatus for storage and retrieval of resume images in a manner which preserves the appearance, organization, and information content of the original document. In addition, summaries or "outlines" of resumé images, broken down into multiple fields, are stored, and can be searched field by field. A user interface is provided which is based on a familiar paper-based method already in common use, thus reducing the training required to effectively use the system.

21 Claims, 14 Drawing Sheets

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COMMUNICATION LINK
140
138
SERVER
DATABASE
MEMORY
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SCANNER
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26
28
134
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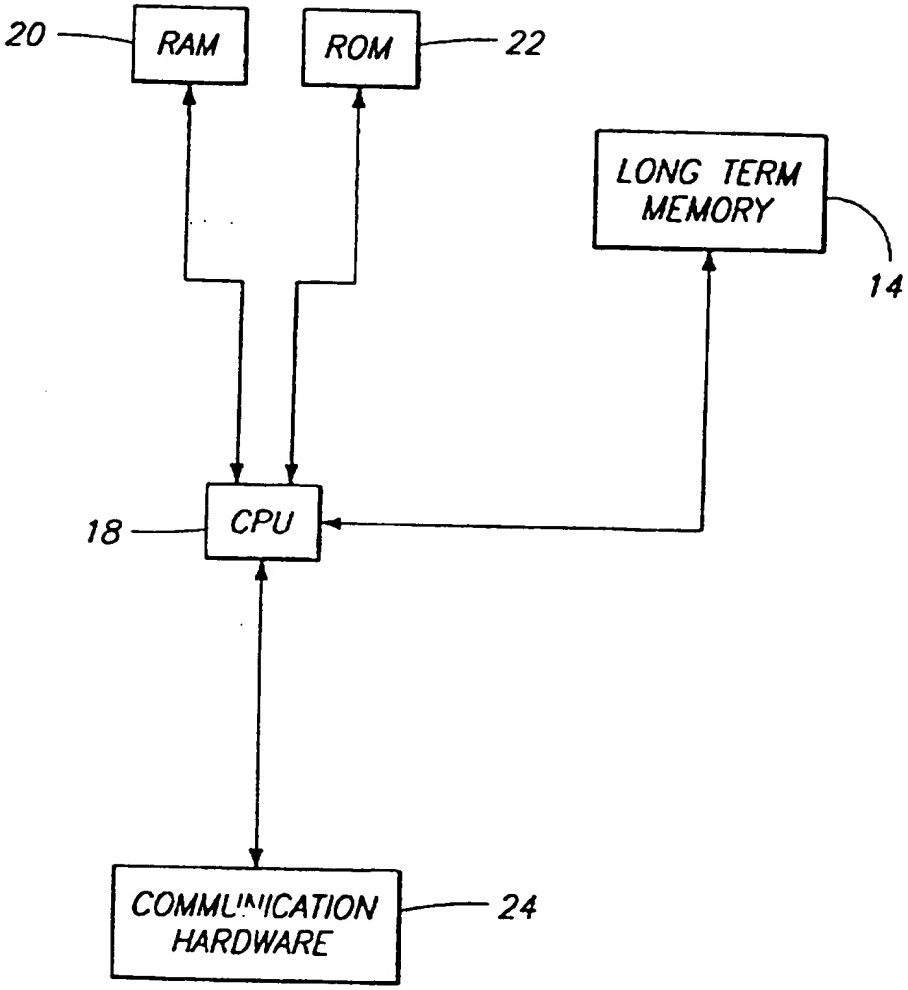
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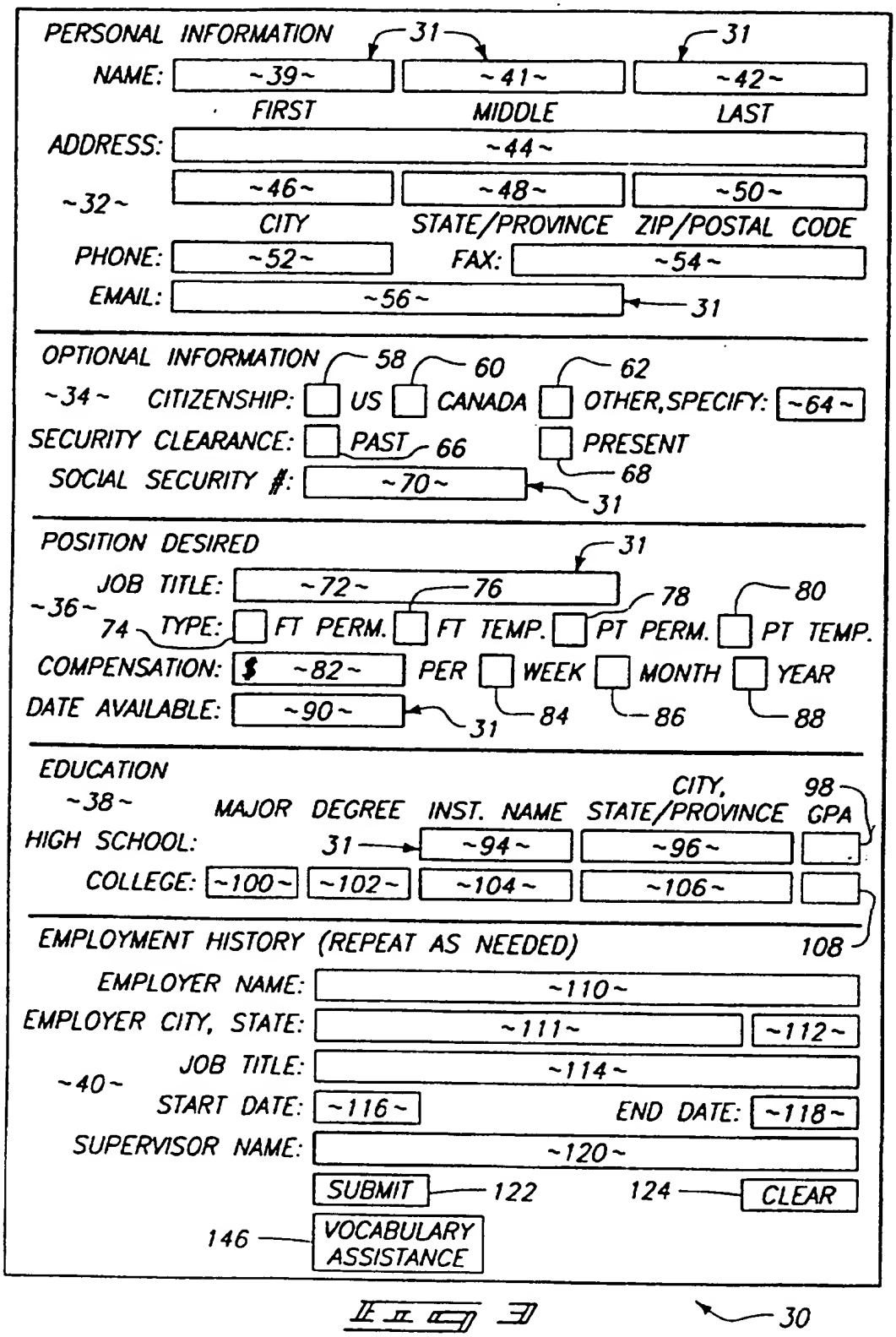
18
CPU
COMMUNICATION HARDWARE
24

Fig 2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EMAIL:
~56~
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60
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CANADA
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SECURITY CLEARANCE:
PAST
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PRESENT
SOCIAL SECURITY #:
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POSITION DESIRED
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JOB TITLE:
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76
78
80
~36~
74
TYPE:
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FT TEMP.
PT PERM.
PT TEMP.
COMPENSATION:
$ ~82~
PER
WEEK
MONTH
YEAR
DATE AVAILABLE:
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84
86
88
EDUCATION
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MAJOR
DEGREE
INST. NAME
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GPA
HIGH SCHOOL:
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COLLEGE:
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~102~
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~106~
108
EMPLOYMENT HISTORY (REPEAT AS NEEDED)
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EMPLOYER CITY, STATE:
~111~
~112~
JOB TITLE:
~114~
~40~
START DATE:
~116~
END DATE:
~118~
SUPERVISOR NAME:
~120~
SUBMIT
122
124
CLEAR
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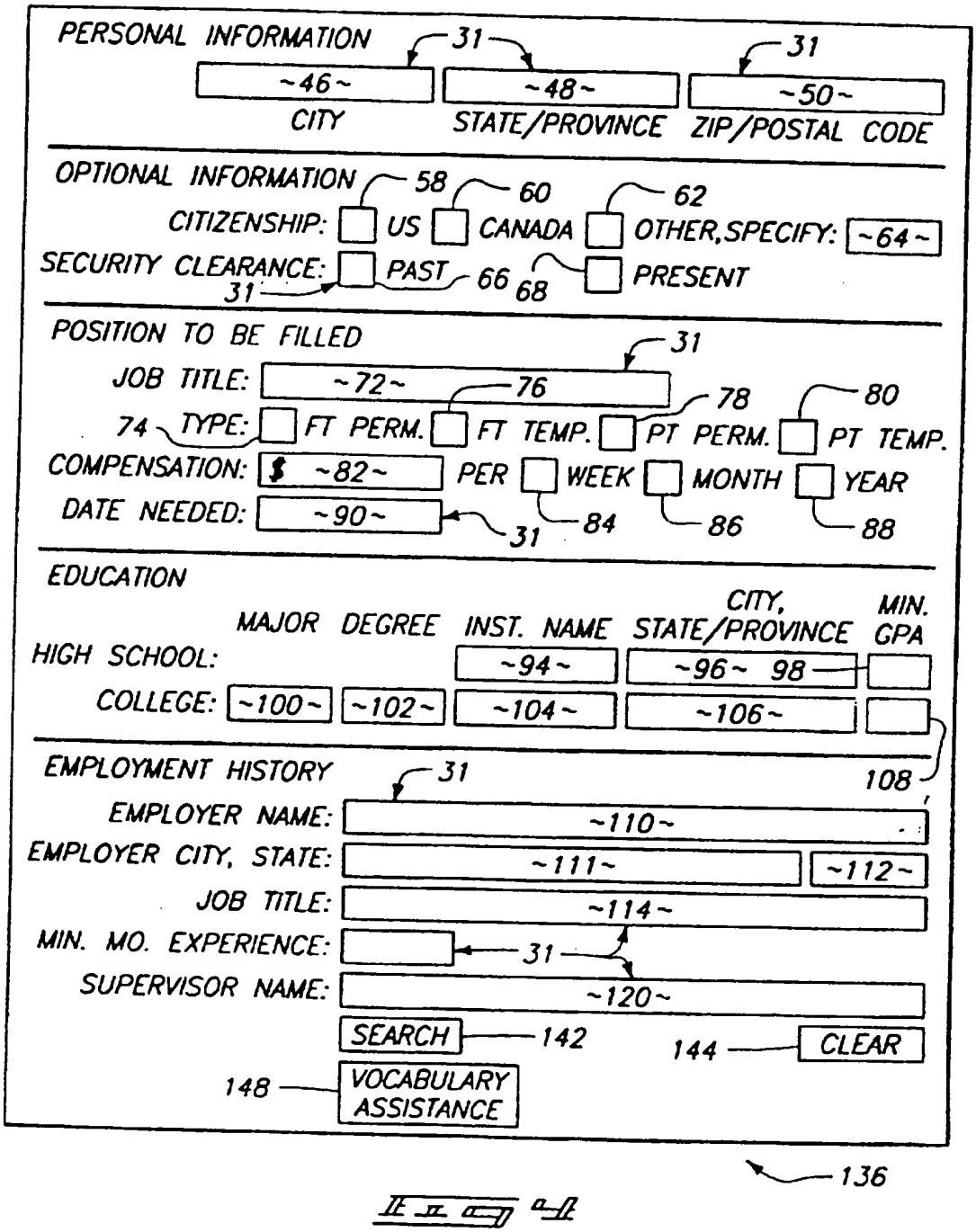
VOCABULARY ASSISTANCE
30

Fig. 3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CANADA
OTHER, SPECIFY:
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SECURITY CLEARANCE:
PAST
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PRESENT
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POSITION TO BE FILLED
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JOB TITLE:
~72~
76
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80
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TYPE:
FT PERM.
FT TEMP.
PT PERM.
PT TEMP.
COMPENSATION:
$ ~82~
PER
WEEK
MONTH
YEAR
DATE NEEDED:
~90~
31
84
86
88
EDUCATION
MAJOR
DEGREE
INST. NAME
CITY, STATE/PROVINCE
MIN. GPA
HIGH SCHOOL:
~94~
~96~ 98
COLLEGE:
~100~
~102~
~104~
~106~
108
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EMPLOYER NAME:
~110~
EMPLOYER CITY, STATE:
~111~
~112~
JOB TITLE:
~114~
MIN. MO. EXPERIENCE:
31
SUPERVISOR NAME:
~120~
SEARCH
142
144
CLEAR
148
VOCABULARY ASSISTANCE
136

Fig. 4a

CITY, ST: WASHINGTON, DC
SECURITY: CURRENT
DESIRED: MATERIALS SPECIALIST
TYPE: FULL TIME PERMANENT
COMP: $6000 PER MONTH
AVAILABLE: JULY 1996
COLLEGE: MASS. INSTITUTE OF TECH.
COLLEGE GPA: 3.5
EMPLOYER: DEPARTMENT OF DEFENSE
JOB TITLE: MATERIALS RADIOLOGIST

Fig 5

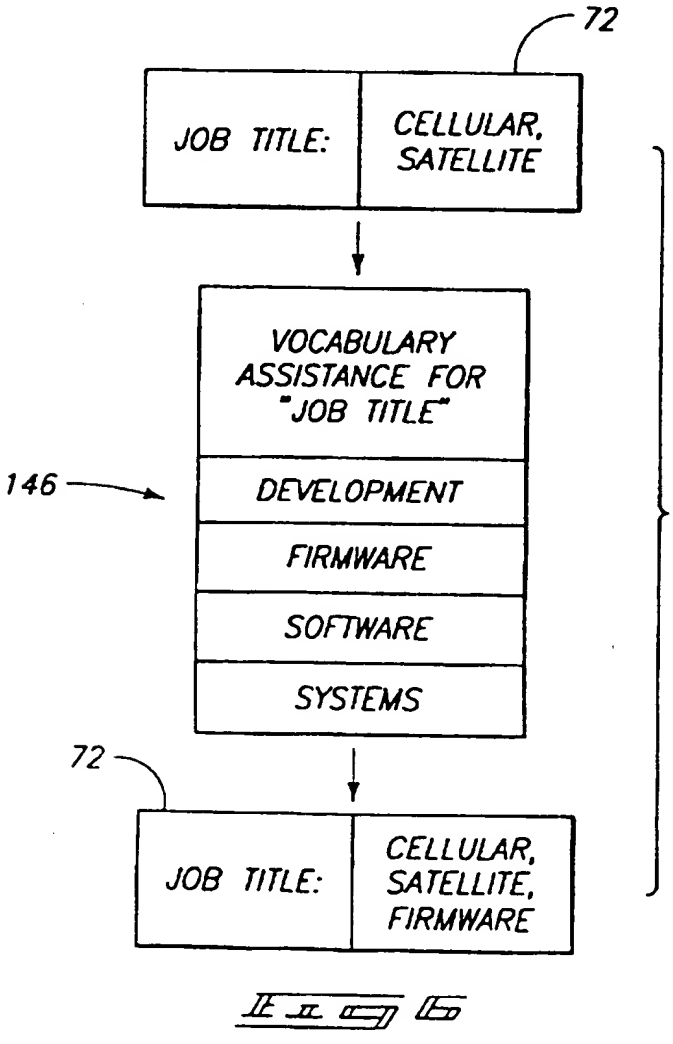

Fig 6

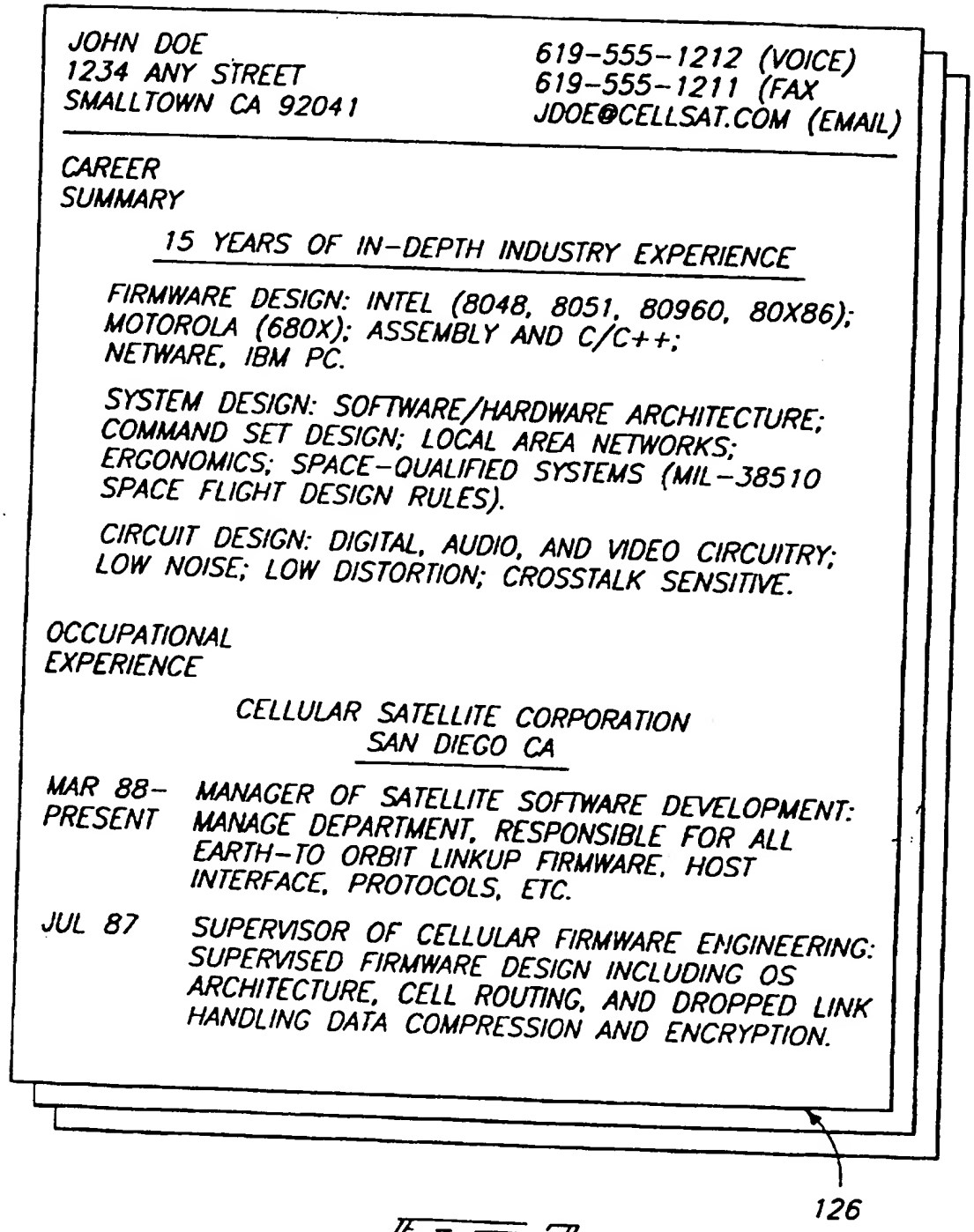
JOHN DOE
1234 ANY STREET
SMALLTOWN CA 92041
619-555-1212 (VOICE)
619-555-1211 (FAX
JDOE@CELLSAT.COM (EMAIL)
CAREER SUMMARY
15 YEARS OF IN-DEPTH INDUSTRY EXPERIENCE
FIRMWARE DESIGN: INTEL (8048, 8051, 80960, 80X86); MOTOROLA (680X); ASSEMBLY AND C/C++; NETWARE, IBM PC.
SYSTEM DESIGN: SOFTWARE/HARDWARE ARCHITECTURE; COMMAND SET DESIGN; LOCAL AREA NETWORKS; ERGONOMICS; SPACE-QUALIFIED SYSTEMS (MIL-38510 SPACE FLIGHT DESIGN RULES).
CIRCUIT DESIGN: DIGITAL, AUDIO, AND VIDEO CIRCUITRY; LOW NOISE; LOW DISTORTION; CROSSTALK SENSITIVE.
OCCUPATIONAL EXPERIENCE
CELLULAR SATELLITE CORPORATION
SAN DIEGO CA
MAR 88- PRESENT
MANAGER OF SATELLITE SOFTWARE DEVELOPMENT: MANAGE DEPARTMENT, RESPONSIBLE FOR ALL EARTH-TO ORBIT LINKUP FIRMWARE, HOST INTERFACE, PROTOCOLS, ETC.
JUL 87
SUPERVISOR OF CELLULAR FIRMWARE ENGINEERING: SUPERVISED FIRMWARE DESIGN INCLUDING OS ARCHITECTURE, CELL ROUTING, AND DROPPED LINK HANDLING DATA COMPRESSION AND ENCRYPTION.
126

Fig 7

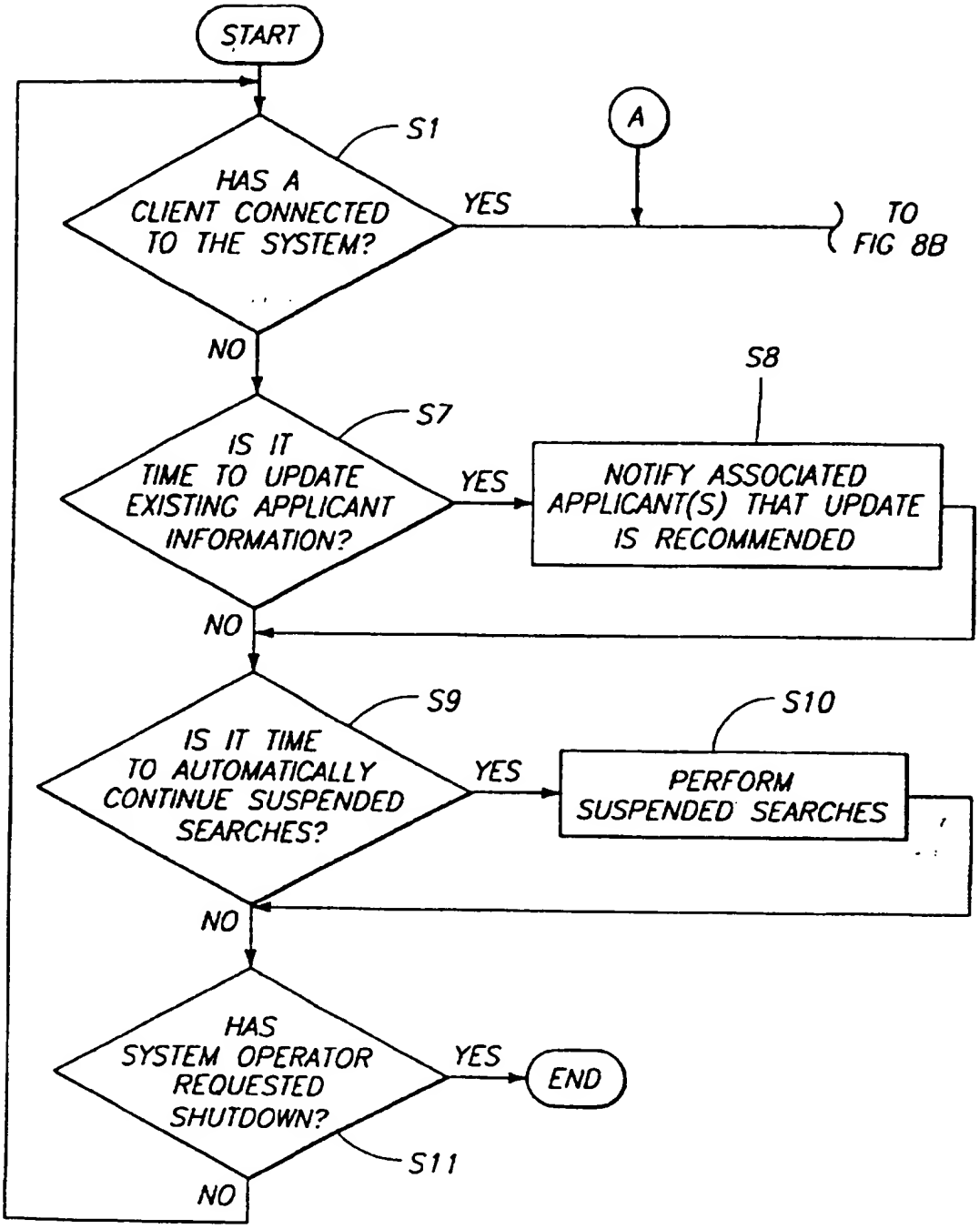
START
S1
HAS A CLIENT CONNECTED TO THE SYSTEM?
YES
A
TO FIG 8B
NO
S8
S7
IS IT TIME TO UPDATE EXISTING APPLICANT INFORMATION?
YES
NOTIFY ASSOCIATED APPLICANT(S) THAT UPDATE IS RECOMMENDED
NO
S9
S10
IS IT TIME TO AUTOMATICALLY CONTINUE SUSPENDED SEARCHES?
YES
PERFORM SUSPENDED SEARCHES
NO
HAS SYSTEM OPERATOR REQUESTED SHUTDOWN?
YES
END
S11
NO

Fig 8A

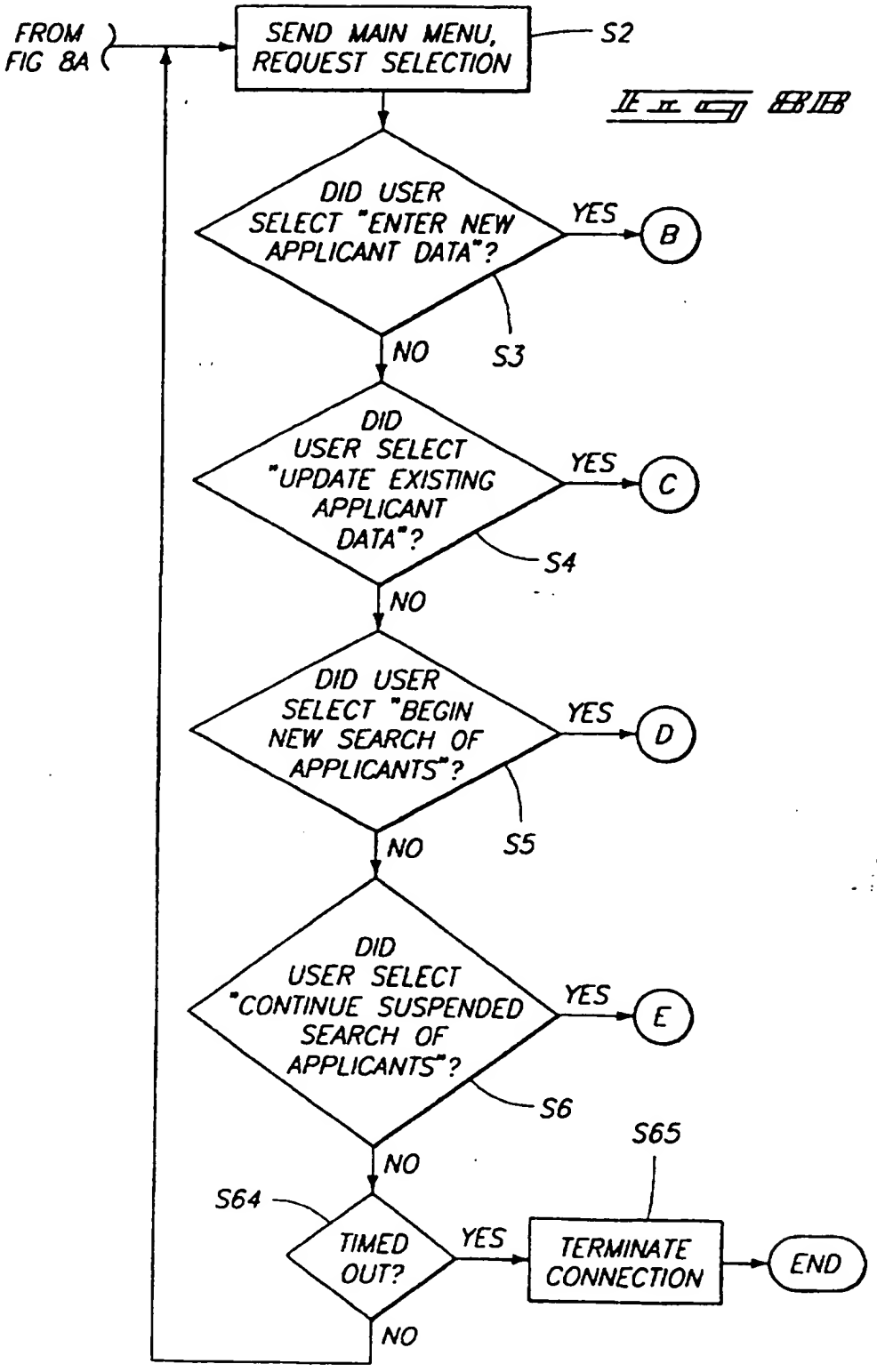
FROM FIG 8A
SEND MAIN MENU, REQUEST SELECTION
S2
DID USER SELECT "ENTER NEW APPLICANT DATA"?
YES
B
S3
NO
DID USER SELECT "UPDATE EXISTING APPLICANT DATA"?
YES
C
S4
NO
DID USER SELECT "BEGIN NEW SEARCH OF APPLICANTS"?
YES
D
S5
NO
DID USER SELECT "CONTINUE SUSPENDED SEARCH OF APPLICANTS"?
YES
E
S6
NO
S65
S64
TIMED OUT?
YES
TERMINATE CONNECTION
END
NO

Fig 8B

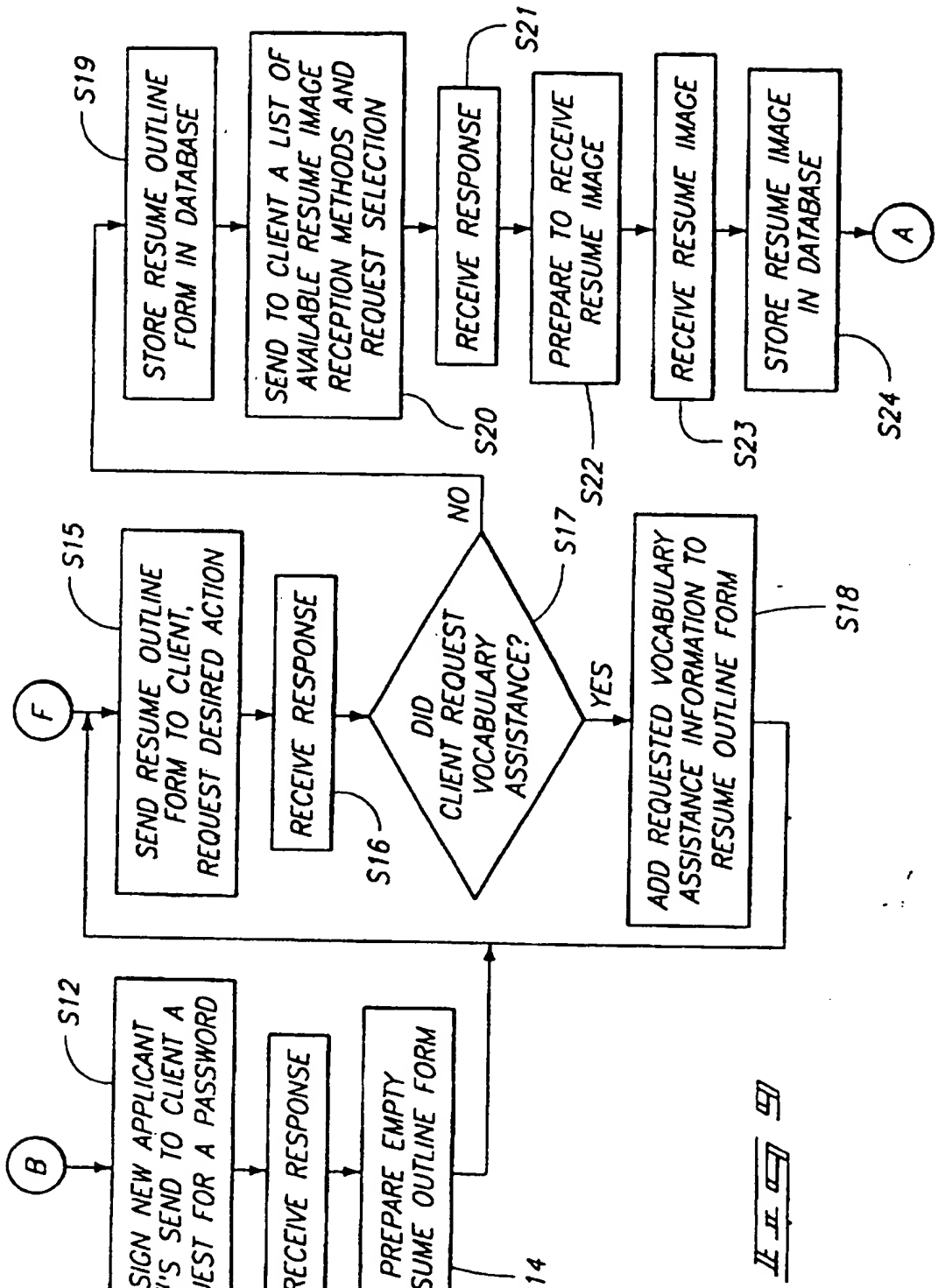
B
S12
ASSIGN NEW APPLICANT ID #'S SEND TO CLIENT A REQUEST FOR A PASSWORD
S13
RECEIVE RESPONSE
S14
PREPARE EMPTY RESUME OUTLINE FORM
F
S15
SEND RESUME OUTLINE FORM TO CLIENT, REQUEST DESIRED ACTION
RECEIVE RESPONSE
S16
DID CLIENT REQUEST VOCABULARY ASSISTANCE?
S17
NO
YES
ADD REQUESTED VOCABULARY ASSISTANCE INFORMATION TO RESUME OUTLINE FORM
S18
S19
STORE RESUME OUTLINE FORM IN DATABASE
SEND TO CLIENT A LIST OF AVAILABLE RESUME IMAGE RECEPTION METHODS AND REQUEST SELECTION
S20
RECEIVE RESPONSE
S21
PREPARE TO RECEIVE RESUME IMAGE
S22
RECEIVE RESUME IMAGE
S23
STORE RESUME IMAGE IN DATABASE
S24
A

FIG 9

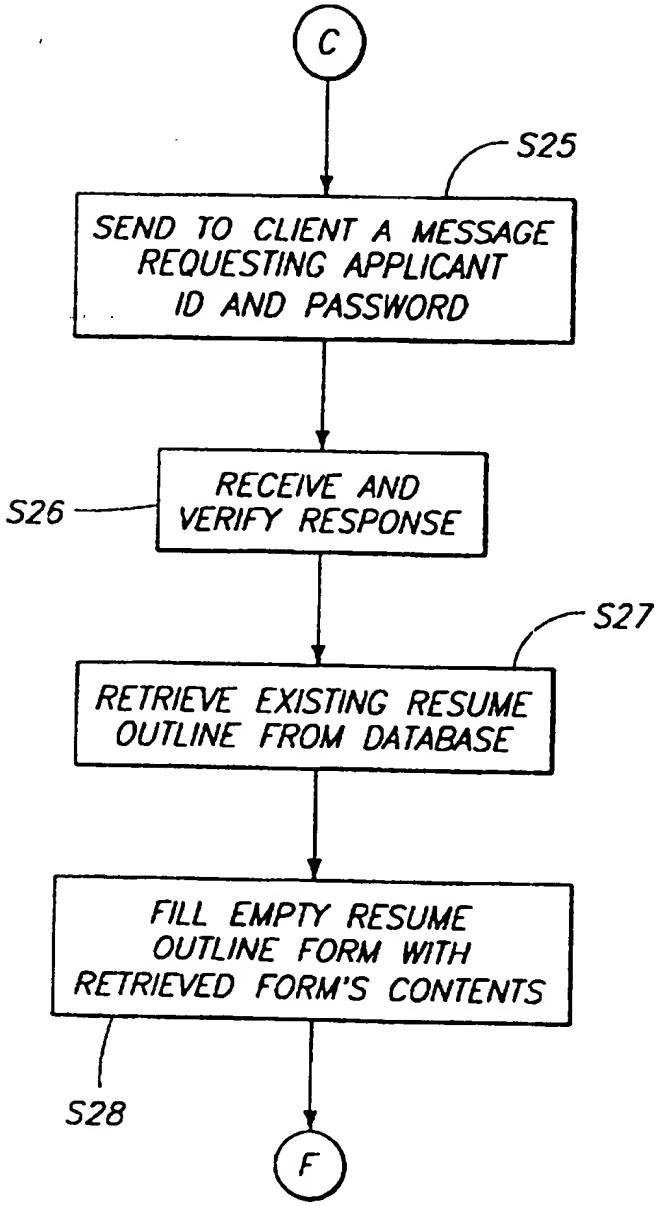
C
S25
SEND TO CLIENT A MESSAGE REQUESTING APPLICANT ID AND PASSWORD
S26
RECEIVE AND VERIFY RESPONSE
S27
RETRIEVE EXISTING RESUME OUTLINE FROM DATABASE
FILL EMPTY RESUME OUTLINE FORM WITH RETRIEVED FORM'S CONTENTS
S28
F

Fig 10

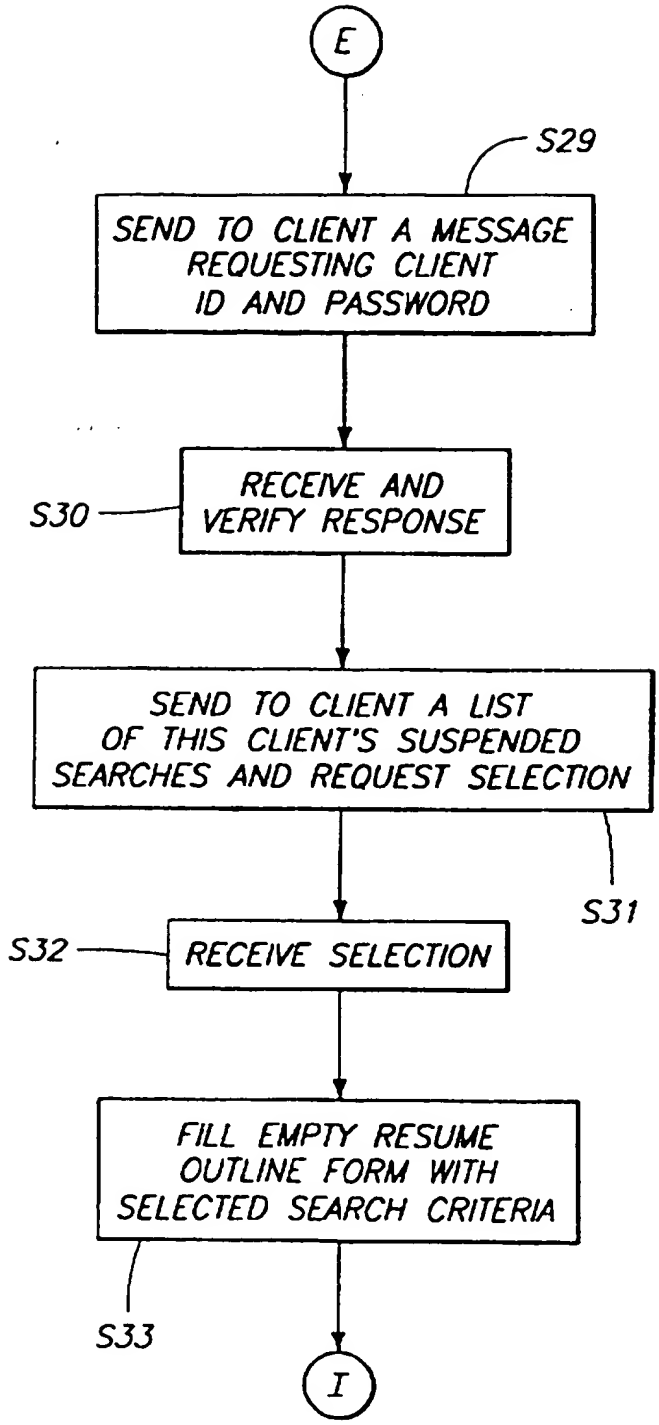
E
S29
SEND TO CLIENT A MESSAGE REQUESTING CLIENT ID AND PASSWORD
S30
RECEIVE AND VERIFY RESPONSE
SEND TO CLIENT A LIST OF THIS CLIENT'S SUSPENDED SEARCHES AND REQUEST SELECTION
S31
S32
RECEIVE SELECTION
FILL EMPTY RESUME OUTLINE FORM WITH SELECTED SEARCH CRITERIA
S33
I

Fig. 11

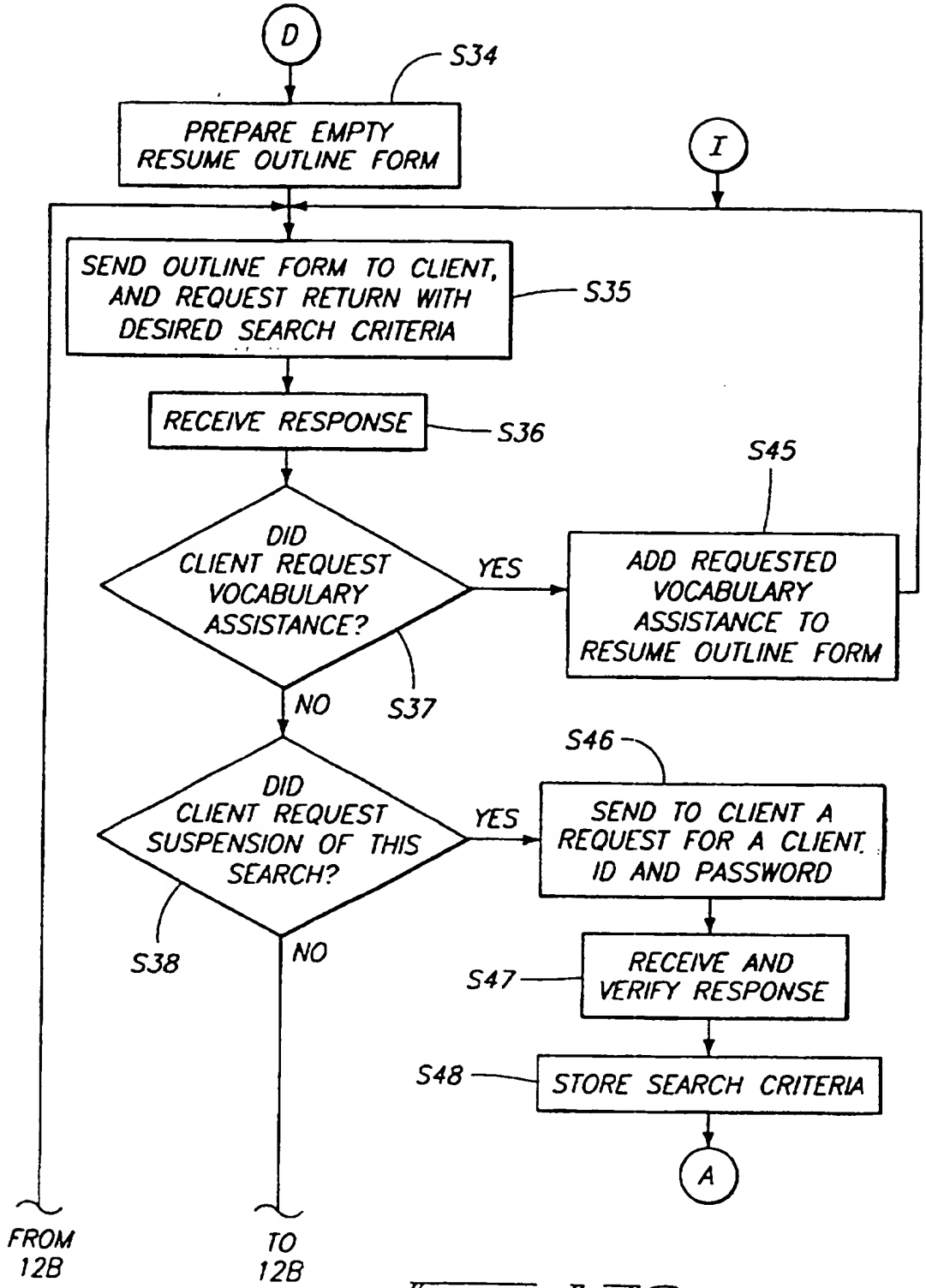
D
S34
PREPARE EMPTY RESUME OUTLINE FORM
I
SEND OUTLINE FORM TO CLIENT, AND REQUEST RETURN WITH DESIRED SEARCH CRITERIA
S35
RECEIVE RESPONSE
S36
S45
DID CLIENT REQUEST VOCABULARY ASSISTANCE?
YES
ADD REQUESTED VOCABULARY ASSISTANCE TO RESUME OUTLINE FORM
NO
S37
S46
DID CLIENT REQUEST SUSPENSION OF THIS SEARCH?
YES
SEND TO CLIENT A REQUEST FOR A CLIENT ID AND PASSWORD
S38
NO
S47
RECEIVE AND VERIFY RESPONSE
S48
STORE SEARCH CRITERIA
A
FROM 12B
TO 12B

Fig 12A

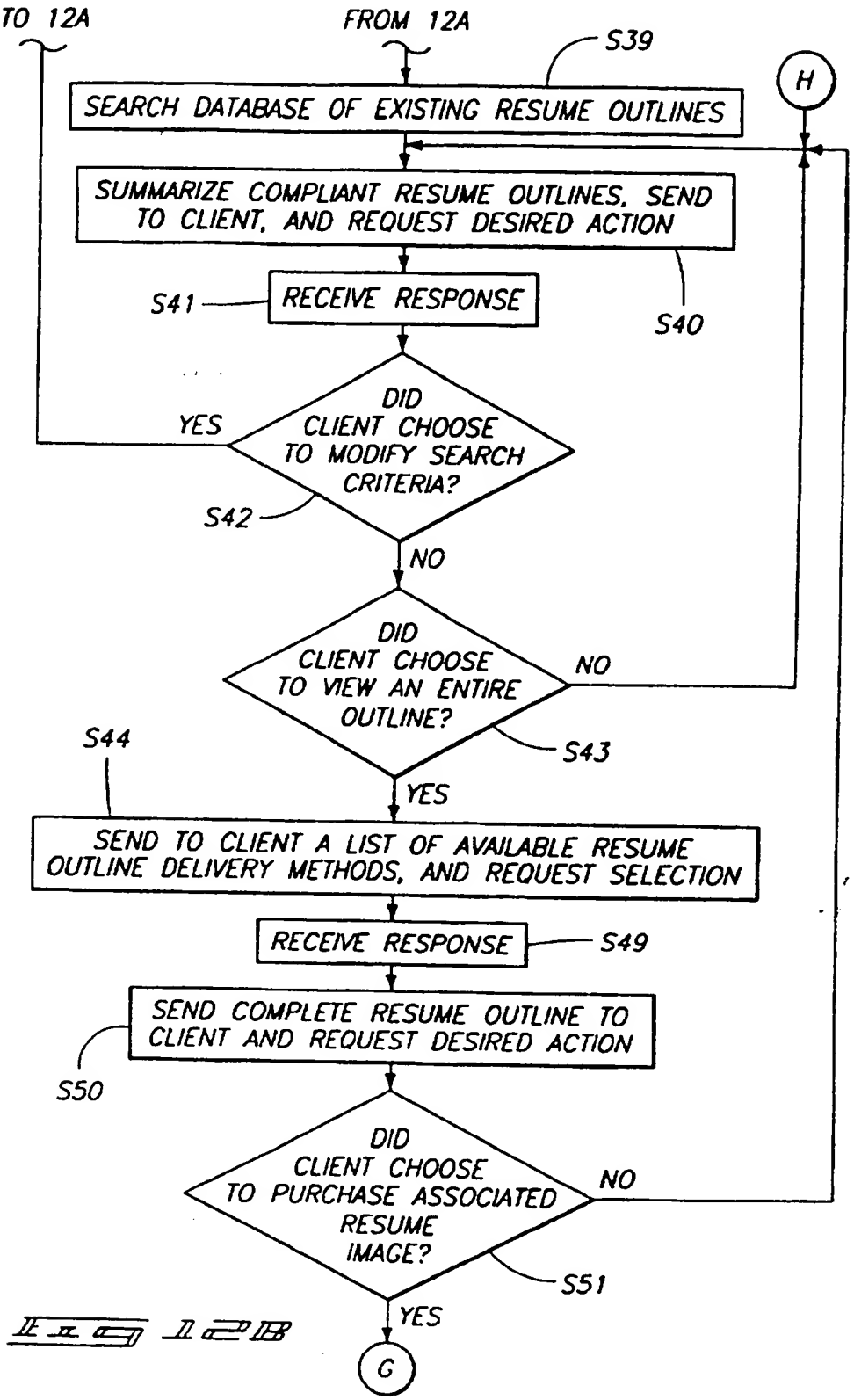
TO 12A
FROM 12A
S39
H
SEARCH DATABASE OF EXISTING RESUME OUTLINES
SUMMARIZE COMPLIANT RESUME OUTLINES, SEND TO CLIENT, AND REQUEST DESIRED ACTION
S41
RECEIVE RESPONSE
S40
DID CLIENT CHOOSE TO MODIFY SEARCH CRITERIA?
YES
S42
NO
DID CLIENT CHOOSE TO VIEW AN ENTIRE OUTLINE?
NO
S43
S44
YES
SEND TO CLIENT A LIST OF AVAILABLE RESUME OUTLINE DELIVERY METHODS, AND REQUEST SELECTION
RECEIVE RESPONSE
S49
SEND COMPLETE RESUME OUTLINE TO CLIENT AND REQUEST DESIRED ACTION
S50
DID CLIENT CHOOSE TO PURCHASE ASSOCIATED RESUME IMAGE?
NO
S51
YES
G

Fig 12B

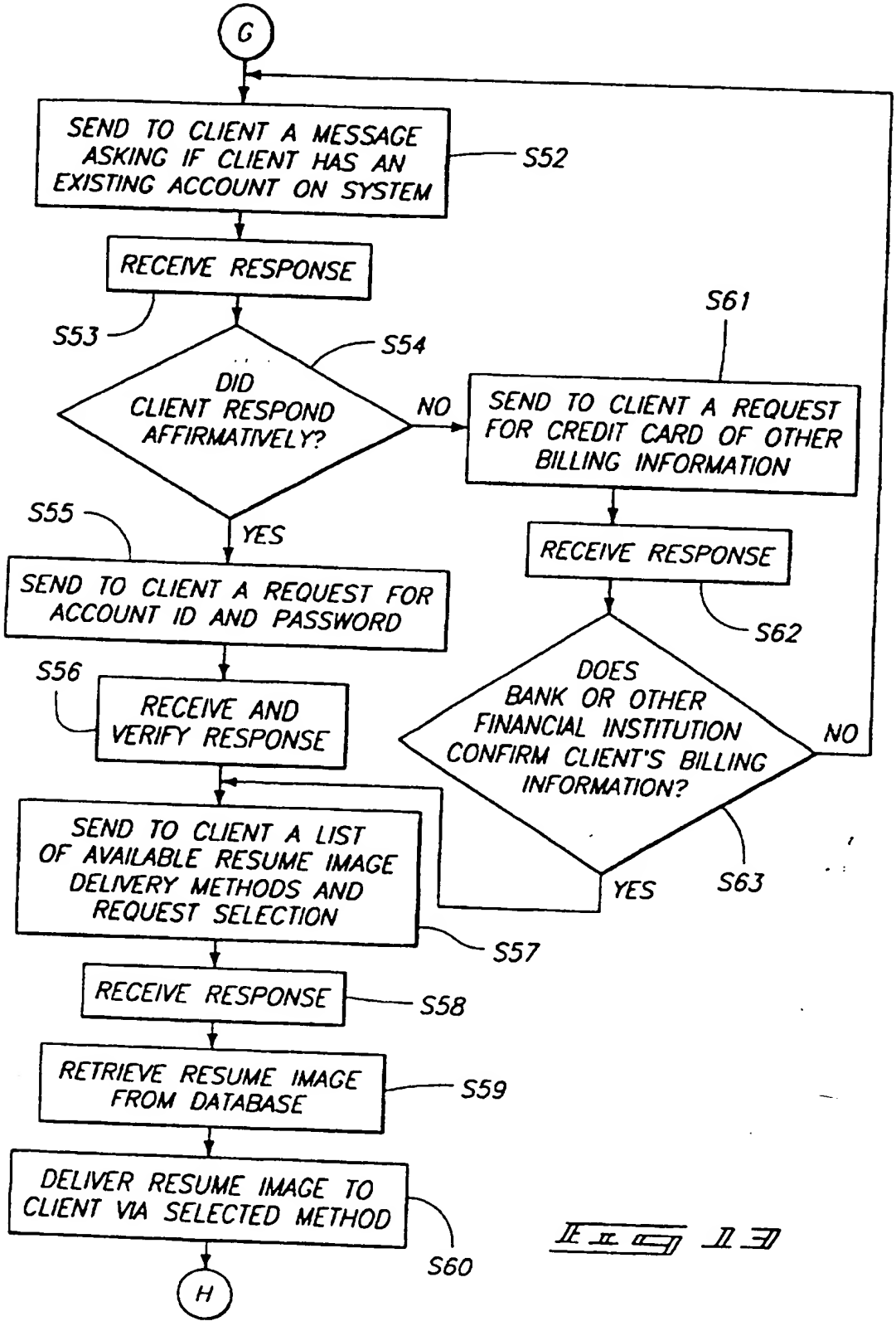
G
SEND TO CLIENT A MESSAGE ASKING IF CLIENT HAS AN EXISTING ACCOUNT ON SYSTEM
S52
RECEIVE RESPONSE
S53
S54
DID CLIENT RESPOND AFFIRMATIVELY?
NO
S61
SEND TO CLIENT A REQUEST FOR CREDIT CARD OF OTHER BILLING INFORMATION
RECEIVE RESPONSE
S62
DOES BANK OR OTHER FINANCIAL INSTITUTION CONFIRM CLIENT'S BILLING INFORMATION?
NO
YES
S63
YES
S55
SEND TO CLIENT A REQUEST FOR ACCOUNT ID AND PASSWORD
S56
RECEIVE AND VERIFY RESPONSE
SEND TO CLIENT A LIST OF AVAILABLE RESUME IMAGE DELIVERY METHODS AND REQUEST SELECTION
S57
RECEIVE RESPONSE
S58
RETRIEVE RESUME IMAGE FROM DATABASE
S59
DELIVER RESUME IMAGE TO CLIENT VIA SELECTED METHOD
S60
H

Fig 13

RESUME STORAGE AND RETRIEVAL SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

This application claims priority of a provisional application, Ser. No. 60/008,700, filed Dec. 15, 1995.

TECHNICAL FIELD

The invention relates to electronic resumé storage and retrieval systems and methods.

BACKGROUND OF THE INVENTION

Resumés are a primary communication medium between employers and job applicants (candidates). Employers annually spend billions of dollars to solicit resumés using newspaper advertisements, job fairs, college recruitment seminars, and other methods. In response, job applicants spend billions more to compose, typeset, print, and ship those resumés.

Unfortunately, present resumé delivery practices are expensive and frustrating for job applicants. Identifying potential employers, obtaining addresses, producing resumés for each, and finally delivering them is burdensome and time-consuming. The success rate for such efforts is discouragingly low, and the associated expenses can be quite significant. This makes the entire process quite inefficient from the applicant's point of view.

Employers, too, suffer from the inefficiencies of resumé collection and handling. The solicitation, receipt, storage, management, search, and retrieval of dozens, hundreds, and in some cases thousands of resumés can be a difficult, unwieldy, and expensive burden on the employer. Physical, paper-based resumés are often stored in desk drawers and filing cabinets. The numerous limitations of present resumé practices include consumption of substantial physical space; difficulty in searching through large quantities of paper documents; the near-impossibility of correlating applicants whose resumés may vary widely in organization, content, and clarity; and the lack of uniformity in the search process from one practitioner to another.

From the above discussion, it is clear that a very significant need exists for an improved method of resumé solicitation, sorting, delivery, handling, and management. Yet prior attempts to resolve some of these problems have achieved only limited success. Document scanners have been used in some attempts to reduce the physical space consumed by physical resumés. However, search methods do not work well on scanned images because scanned resumés are stored as pictures, not searchable words or text.

Optical Character Recognition (OCR) has been used in some attempts to convert paper-based resumés to pure text. However, employers are typically unwilling to forgo the traditional resumé because of the widely held belief that the ability to review the format, style, and presentation of the resumé itself is of value.

Still other attempts have employed the aforementioned OCR conversion to allow the use of "keyword" search methods on the resulting text of full resumés, in an attempt to find those which contain key words or phrases. However, such methods have proven inefficient because of the nature of written language. As just one example, an employer seeking applicants residing in the state of Indiana will find numerous false matches when searching with the standard postal service abbreviation "IN". The letter pair "in" appears

frequently in the English language (many times in this sentence alone), yet most such matches in the full text of a resumé would have little or nothing to do with the searcher's true intent.

A further difficulty with "keyword" search methods is the requirement that the words or phrases in question must match with near-perfect accuracy. The diversity of job applicant writing skills and vocabularies causes many resumés, which otherwise might describe applicants with similar attributes, to be written using very different terms and phrases. Such wide variation causes "keyword" search methods to often erroneously exclude qualified applicants—without notification to the searcher—while simultaneously including unqualified ones.

Prior attempts at applying computer technology to resumé management have been limited in scope, applicability, and usefulness. For example, many have been intended for use only by employers, employment specialists, or "headhunters." Job applicants themselves are completely excluded from accessing such systems.

One prior attempt, described in U.S. Pat. No. 5,164,897 to Clark et al. (incorporated by reference), is illustrative. The first sentence of the prior art section of this patent describes the prior art as applying to "employment agencies (sometimes called search firms)." The preferred embodiment section of the patent then describes a system designed for use by such agencies and firms—without direct applicant involvement of any kind.

Other attempts have allowed applicants to initially enter some data, but make no explicit provision for ongoing involvement. Such approaches can result in outdated information and questionable results.

Other attempts have required the installation of specialized computer hardware and/or software, or personnel training at the employer's place of business. The difficulty in learning and using the system often effectively restricts access to just those who have been appropriately "trained."

Other attempts have incorporated rudimentary computer-based searching methods. The most common method involves the aforementioned "keyword" searches, on the contents of entire resumés, such as offered by Online Career Center, Indianapolis, Ind. and TMP Interactive, Framingham, Mass. The inherent limitations of such methods have already been discussed.

Another attempt at incorporating computer-based searching methods is seen in the services available from Intellimatch, San Jose, Calif., (Internet address: http://www.intellimatch.com). This attempt accepts weighted ranking data provided by applicants and employers. There are several disadvantages of this type of method: First, the user interface for interacting with such ranking systems can be complex, non-intuitive, unfamiliar, difficult to learn, and slow to operate. Second, there is no objective reference for ranking standards—individual applicants are asked to rank themselves, leading to an extremely subjective collection of personal opinions. Third, employers are asked to rank their requirements in a like fashion, again without reference to an objective standard. Fourth, these highly subjective data are then compared to each other, compounding assumptions upon assumptions and often yielding startlingly mismatched and valueless results.

Another attempt at providing resumé services on the Internet is provided by Beverly Hills Software, 469 South Bedford Drive, Beverly Hills, Calif. 90212. (Internet address: http://www.Bhs.Com). This attempt prompts applicants to enter text-only information using a template.

However, keyword searches still involve searching the entire contents of resumé data; no searching by fields is available. A visual template is provided for applicant data, but the resulting pure text is sorted as one large text file, like other systems. There is also no provision for charging or collecting fees.

Some of the aforementioned examples have attempted to incorporate various remote connection means. Such remote methods have traditionally been limited to text-only resumé storage and keyword-based searches of the full resumé text. None have succeeded in addressing all of the problems described above.

SUMMARY OF THE INVENTION

The invention provides a method of and apparatus for storage and retrieval of resumé images in a manner which preserves the appearance, organization, and information content of the original document.

One embodiment of the invention provides a method of and apparatus for storing formatted summaries or "outlines" of resumé images, and efficient searching and subsequent selection of the resumé outlines and their associated resumé images.

One embodiment of the invention provides a user interface for creating the aforementioned resumé outlines which is based on a familiar paper-based method already in common use, thus reducing the training required to effectively use the system.

One embodiment of the invention provides a method of and apparatus for computer-assisted searching of the aforementioned stored resumé outlines in a manner which minimizes the need for specialized equipment and training. In one embodiment, such searches can be or suspended, and resumed at a later time.

One embodiment of the invention provides a method of and apparatus for enabling the automatic and continuous execution of the searches through resumé outlines, thereby determining when a potentially qualifying applicant has entered their resumé outline and resumé image and enabling employers to be automatically notified thereof.

One embodiment of the invention provides a method of and apparatus for coordinating the terminology and vocabulary used by applicants and potential employers in the entry and searching for the aforementioned resumé outlines.

One embodiment of the invention provides a method of and apparatus for the controlled expansion of the terminology and vocabulary used by applicants and potential employers in the entry of and searching of the aforementioned resumé outlines.

One embodiment of the invention employs modern communications systems, such as the Internet, the "World Wide Web", or other commercial "connectivity services", for applicant submission of outlines or resumé images, or employer searches through outlines or viewing of resumé images.

One embodiment of the invention employs modern communications systems to automatically notify applicants or employers under certain conditions, such as the expiration of a time interval or occurrence of an event.

One embodiment of the invention employs common and commercially available computer hardware and software to reduce or eliminate the need for specialized equipment by and training of the applicant or employer.

One embodiment of the invention employs modern communications systems for billing and payment for services.

Other features of the invention will become apparent to those of ordinary skill in the art upon review of the following detailed description, claims, and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention are described below with reference to the following accompanying drawings.

FIG. 1 is a block diagram illustrating a system embodying the invention.

FIG. 2 is a block diagram of a server included in the system shown in FIG. 1.

FIG. 3 is an example of a resumé outline form sent from the server of FIG. 2 to an applicant's client machine included in the system of FIG. 1.

FIG. 4 is an example of a search request form sent from the server of FIG. 2 to an employer's client machine included in the system of FIG. 1.

FIG. 5 is an example of a summary of a resumé outline sent from the server of FIG. 2 to an employer's client machine in response to a search request.

FIG. 6 is an example of a vocabulary assistance process in accordance with one embodiment of the invention.

FIG. 7 is an example of a resumé image stored by the server of FIG. 2.

FIGS. 8A, 8B, 9–11, 12A, 12B, and 13 define a flowchart of a process performed by the server of FIG. 2, in accordance with one embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

This disclosure of the invention is submitted in furtherance of the constitutional purposes of the U.S. Patent Laws "to promote the progress of science and useful arts" (Article 1, Section 8)

FIG. 1 shows a resumé storage and retrieval system 10 embodying the invention. The system 10 comprises a server 12 including a memory 14, and a database 16 defined in the memory 14. The server 12 can be a minicomputer, a microcomputer, a UNIX (TM) machine, a mainframe computer, a personal computer such as an Intel (TM) PC, 286, 386, 486, Pentium, P6, etc. (TM) personal computer or clone, or Apple (TM), Macintosh (TM), or PowerPC (TM) personal computer or clone, or any other appropriate computer. The memory 14 is preferably long term memory (e.g. hard drive, disk drive, tape unit, CD-ROM, etc.). The server 12 includes typical components (FIG. 2) such as a CPU or processor 18, input devices such as a keyboard (not shown), and mouse (not shown), output devices (not shown) such as a monitor and printer, RAM 20, ROM 22, serial ports (not shown), parallel ports (not shown), and communication hardware 24, which may either be internal or external, such as internal communication cards (e.g., modem card or network card) or external communication hardware (e.g., external modem), etc. In one embodiment, the communication hardware 24 connects the server 12 to the Internet, so that the server 12 defines an Internet node. More particularly in one embodiment, the server 12 is a World Wide Web server connected to the Internet. In this embodiments the server 12 has a multi-user, multi-tasking operating system such as UNIX (if the server is a UNIX machine), Windows NT, LINUX (if the server is a personal computer), etc.

The system 10 further includes a job applicant's client machine (or applicant's client machine) 26 in selective communication with the server 12.

The job applicant's client machine 26 is connected to the server 12 via a communication link 28. Various possible types of communication link can be employed for the communication link 28 between the server 12 and the applicant's client machine 26. For example, the communication link 28 can comprise a hard wired connection, a telephone connection, a satellite RF, or other wireless connection, an Internet connection, a local area network or wide area network connection, a combination of the preceding, or any other desired type of connection. Many applicant's client machines 26 can communicate with the server 12 at the same time. Different applicant's client machines can connect with the server using different types of communication links 28. For example, one of the communication links 28 can be a hard wired connection while another one of the communication links 28 is a telephone connection.

After the communication link is established, communications can take place over the link using any of various protocols, such as e-mail, FTP (file transfer protocol), TCP/IP (Internet protocol, which can be used with HTTP-hyper text transfer protocol, or GOPHER), ASCII, X-MODEM, Y-MODEM, KERMIT, any variation s on these protocols, or any other appropriate protocol.

During a session, the server 12 communicates to the applicant's client machine a resumé outline form 30 (FIG. 3) to be completed by a job applicant. The form 30 has a plurality of fields 31 relevant to employment, using which typical information found on a resumé is summarized by the applicant. The form 30 has fields that are similar to blanks found on traditional job application forms available from employers.

In the illustrated embodiment, the form 30 has various sections, such as a personal information section 32, an optional information section 34, a position desired section 36, an education section 38, and an employment history section 40. Other sections can be used, as desired. Each section has various fields 31.

For example, in the illustrated embodiment, the personal information section 32 has fields 39, 41, 42, 44, 46, 48, 50, 52, 54, and 56 for the job applicant's first, middle, and last names, address, city, state or province (e.g., the two letter postal service abbreviations), zip code or postal code, phone number, fax number, and e-mail address, respectively; the optional information section 34 has fields 58, 60, 62 and 64 relating to citizenship, fields 66 and 68 relating to security clearance, and a field 70 for a social security or social insurance number; the position desired section 36 has a field 72 for job title, fields 74, 76, 78, and 80 relating to the type of employment sought (full time permanent, full time temporary, part time permanent, or part time temporary), fields 82, 84, 86, and 88 relating to compensation requirements, and a field 90 relating to the date when the applicant will be available for the new position, the education section 38 has fields 94, 96, 98, 100, 102, 104, 106, and 108 relating to majors, degrees, school names and locations, and grade point averages (multiple copies of fields 100, 102, 104, 106 and 108 can be included for multiple colleges attended); and the employment history section 40 has fields 110, 111, 112, 114, 116, 118, and 120 for employer name, employer city, employer state or province, previous job title, start date for that position, and end date for that position (multiple copies of fields 110, 111, 112, 114, 116, 118, and 120 can be included for multiple prior positions).

Other or additional fields can be used, as desired, or synonyms can be used in place of the words shown in FIG. 3 adjacent the fields. For World Wide Web applications, the form 30 is an HTML form, and has "submit" and "clear" buttons 122 and 124 using which the applicant can either send the information from the filled fields to the server, or can clear the form and start over. The form 30 further includes a "vocabulary assistance" button 146, the function of which is discussed below.

Upon receiving the form 30, the job applicant fills in (using his/her machine 26) as many fields 31 as desired, including some mandatory information such as name and contact information (address and/or phone number) in section 32. The applicant also effects creation of a graphics file 126 (FIG. 7) of the applicant's resumé for receipt by the server.

The graphics file 126 contains all the formatting, fonts, and margins of a traditional paper resumé, and is of great assistance to employers wishing to gain some insight into the professionalism of an applicant. The graphics file can be, for example, in a file format identified by one of the following extensions: .GIF,.TIF (or .TIFF), .JPG (or .JPEG or .JPE),.BMP,.TGA,.EPS,.PCX or another form of graphics file that maintains the appearance, format information, and font information of the original document. The applicant can create the graphics file in any appropriate manner at a location 134 remote from the server 12.

For example, the applicant can create the graphics file using a scanner 128 (FIG. 1), by scanning his or her actual printed resumé. Alternatively, the applicant can use a facsimile machine 130 (FIG. 1) to fax his or her actual printed resumé to a facsimile machine 132 in the possession of the administrator of the system 10 (e.g., located at the location of the server 12). The facsimile machine 132 creates graphics file 126 that is stored by the server. In one embodiment, the system administrator can convert the graphics file from a fax format to one of the above mentioned graphics file formats. Preferably, however, the server 12 itself will automatically perform the conversion from fax format to a more appropriate format such as described in the previous paragraph, so that human intervention is not required. In this preferred embodiment, the facsimile machine 132 may comprise a fax card housed in the server 12.

In another embodiment, the system administrator can receive a mail copy of a printed resumé, and can scan it into the server 12 for the applicant using a scanner 133 in the possession of the system administrator (e.g., located at the location of the server 12).

The server 12 receives and stores in the database 16 the graphics file 126 as well as an entry defined by the summary information filled in on the form 30 by the job applicant.

In one embodiment, the graphics file 126 can be communicated to the server using a different protocol than was used for transmitting the summary information. For example, the summary information can be sent from the applicant's client machine 26 to the server 12 via HTML, and the graphics file 126 can be sent from that applicant's client machine 26 to the server 12 via e-mail. Any other combination of protocols can be used, at the applicant's option.

The form 30 is useful in that it provides searchable information. The information of the graphics file 126 cannot be easily searched. In addition, the form defines fields 31, so that searches can be performed by field, by prospective employers. Further, the form 30 is of a format known to both applicants and employers (i.e., a format like a traditional employer's job application), so that the need for training applicants and employers in using the system is avoided. Instead, applicants can easily fill the form 30, and employers

can easily search the database. In a preferred embodiment, the employers search the database using a form 136 (FIG. 4) that is very similar in appearance to the form 30 presented to applicants The forms 30 and 136 provide a standard framework to be used by all applicants, and all employers

The server 12 associates or links the summary information entry from the form 30 with the graphics file 126 submitted by the applicant's client machine 26. In other words, if a search by an employer turns up the summary information for a particular applicant, the graphics file 126 containing an image of that applicant's resumé can be easily pulled up as well.

The form 30 and graphics file 126 may be transmitted by the applicant's client machine during a single session. It is also possible that the applicant may fill out and transmit the form 30 during one session, and then upload the resumé image during another session. Or, the applicant could fax a resumé at some later time. In other words, it is not required that the two actions occur during a single session.

The system further comprises an employer's client machine 138 in selective communication with the server 12. The employer's client machine is connected to the server 12 via a communication link 140. Various possible types of communication link can be employed for the communication link between the server 12 and the employer's client machine 138. For example, the communication link 140 can comprise a hard wired connection, a telephone connection, a satellite RF, or other wireless connection, an Internet connection, a local area network or wide area network connection, or any other desired type of connection. Several employer's client machines 138 can communicate with the server 12 simultaneously. Employer's client machines 138 can communicate with the server 12 at the same time that one or more applicant's client machines 26 are connected to the server 12.

Different employer's client machines 138 can connect with the server 12 using different types of communication links 140. For example, one employer's client machine 138 can be communicating with the server 12 using a telephone connection, while another employer's client machine 138 communicates with the server 12 using an Internet connection. Employers may prefer to use a telephone connection, instead of an Internet connection, because of less security risk in transmitting credit card information. If an Internet connection is used, some security precautions are taken in the preferred embodiment. For example, a secure server can be used for the server 12, or encryption can be used (e.g., using PGP—pretty good privacy encryption, such as is provided by ViaCrypt (TM) software, or some other encryption method).

Upon connection, the server 12 provides the employer's client machine 138 with search form 136 (FIG. 4). The search form 136 is preferably similar to the form 30 filled by applicants, as described above, and preferably includes fields 31 corresponding to fields contained on the form filled by applicants. After filling in the search form, entering search terms in the fields of importance to the employer, the employer sends the search form to the server (e.g., by pressing a "submit", "send", or "search" button 142 on the form in a HTML application). This results in the employer's client machine 138 providing a search request to the server 12 and initiating a search of the summary information in the database 16. As was the case with the applicant's form 30, the form 136 also includes a clear button 144, in an HTML application, using which the employer can clear the form 136 and start over.

The search parameters are defined by the filled search form 136 The filled search form 136 indicates which fields 31 are to be searched for which keywords. For example, based on which fields 31 are filled with which keywords, a search query can be constructed which takes the logical "OR" of each word contained in a field, and which takes the logical "AND" of each of the fields 31. Other logical and weighted combinations are possible. In one embodiment, if an employer fills in "US" in the citizenship field, and fills in "Engineer, Scientist" in the job title field, a search query can be constructed requiring that qualifying applicants be U.S. citizens AND be engineers OR scientists. Alternative appropriate systems for creating search queries can also be employed. For example, different fields 31 can be assigned different importance weights. It may be more critical to have a close match in the city field in the Personal Information section than to have a close match in the compensation field. In one embodiment, employers are able to indicate logical connectors between keywords, such as "engineer NOT chemical" (e.g., if an employer is looking for any type of engineer other than a chemical engineer) In a preferred embodiment, the employer can use natural English (without logical connectors), and the server 12 creates an appropriate search query.

Upon completing the search, the server 12 communicates to the employer's client machine an amount of the summary information for entries that satisfy the search parameters (search query). Preferably, contact information (e.g., name, address, phone number, e-mail, fax number, etc.) of qualifying applicants is suppressed at this stage. In one embodiment, the information presented to the employer for each entry that satisfies the search parameters is "summarized" information, for easy and quick review in a standardized, compact, format. An example of summarized information is shown in FIG. 5.

Relevancy ranking is performed in a preferred embodiment. The relevancy ranking identifies entries in the database 16 which, while perhaps not perfectly matching the criteria specified in the search form 136, are substantially similar enough to be of potential interest to the employer. Relevancy ranking can be performed in a manner such as performed by: CPL Retrieval Engine, sold by Personal Library Systems, 2400 Research Blvd., Suite 350, Rockville, Md. 20850; NexTrieve Indexing Engine from Nexial Systems, St. Annastraat 4, 6109 RH, Obé en Laak, The Netherlands; MetaMorph Text Retrieval Engine sold by Thunderstone Software—EPI Inc., 11115 Edgewater Drive, Cleveland, Ohio 44102; InTEXT Retrieval Engine, sold by InTEXT Systems, 715 Sutter Street, Folsom, Calif. 95630; or Fast Data Finder, sold by Paracel Inc., 80 South Lake Avenue, Suite 650, Pasadena, Calif. 91101, or any other appropriate manner.

Summarized information (as shown in FIG. 5) is provided for the best matches to the search request, after taking into account the relevancy ranking described above The maximum number of matches supplied to the employer's client machine can be set to any appropriate number by either the administrator of the system 10, or the employer performing the search. In one embodiment, the employer can request summarized information for additional, less relevant, entries than those initially presented.

The server 12 then queries the employer's client machine as to whether to present graphics files 126 of resumés associated with the entries that satisfy the search parameters. The server does not present the graphics files 126 of the resumés or the contact information for entries that satisfy the search parameters until payment is made or authorized by the employer.

The employer may establish an account, and provide billing information (such as by providing a credit card number) to the administrator of the system 10 at one time, and will then be able to subsequently log in using a password, and order contact information and graphics files without having to again transmit a credit card. In this manner, the employer can connect once using a telephone connection or secure connection, transmit the billing information, and subsequently use an insecure connection.

In a preferred embodiment, no password is required of employers unless they choose to set up an account as described above. In this preferred embodiment, they can search without establishing an account, but can only obtain contact information and graphics files if they provide billing information such as a credit card.

Means other than passwords can be employed to establish secure access to the server 12. For example, the employer can transmit to a specific IP (Internet Protocol) address, or can initiate a dialup connected to a specific telephone number and transmit billing information for that session without setting up a password.

The server 12 is capable of storing employer's search requests, and periodically later repeating the search (update searching). Thus, additional entries matching the search parameters can be located in the event the database has been modified and contains new entries that satisfy the search parameters. If the employer desires the ability to store search requests and perform update searches, he or she will be required by the server 12 to obtain a user name and password, so the employer can be identified by the server in a subsequent connection session.

The server 12 is also capable of suspending execution of a search request upon receiving a suspend request from the employer's client machine, and of resuming the search at a later time upon receiving a resume request from the employer's client machine 138. For example, the employer may view the summary information for a certain number of "hits" (entries that satisfy the search parameters) and wish to take a break before more closely studying the results, or before looking at less relevant matches. Again, if the employer desires the ability to suspend and later resume search requests, he or she will be required by the server 12 to obtain a user name and password, so the employer can be identified by the server 12 in a subsequent connection session.

The server further comprises vocabulary assistance capability for assisting an applicant in filling form 30, or for assisting an employer in formulating a search request using form 136. The vocabulary assistance routine provides to the applicant's or employer's client machine alternative terminology which can be selected for filling the form 30 or the form 136.

An example of vocabulary assistance is illustrated in FIG. 6. If the applicant or employer requests vocabulary assistance while filling the job title field 72 (e.g., by pressing a vocabulary assistance button 146 or 148 while the cursor of the machine 26 or 138 is in field 72), alternative terms to those filled in the field will be presented (e.g., by presenting a menu, such as a pop-up menu, to the machine 26 or 138). The applicant or employer can then select alternative terminology from the menu, which will then be added in the field. Alternatively, instead of using the vocabulary assistance while initially filling the form 136, an employer may be dissatisfied with the results of a search, and may then return to the form 136 and initiate vocabulary assistance on one or more of the fields. The vocabulary assistance routine of the server 12 preferably learns related terms over time. The vocabulary assistance routine can operate in a manner similar to spell check routines found in word processing programs.

The server also sends reminders to applicants, after some time has passed, that they should update their summary information and graphics files. This can be via e-mail, or any other desired manner.

FIGS. 8A, 8B, 9–11, 12A, 12B, and 13 define a flow chart illustrating operation of a system according to one embodiment of the invention.

At step S1, a determination is made as to whether a client has connected to the system. If so, the system proceeds to step S2; if not, the system proceeds to step S7.

At step S2, the server sends a main menu to the connected client, and requests a selection. After performing step S2, the system proceeds to step S3.

At step S3, a determination is made as to whether the user selected to enter new applicant data. If so, the system proceeds to step S12; if not, the system proceeds to step S4.

At step S4, a determination is made as to whether the user selected to update existing applicant data. If so, the system proceeds to step S25; if not, the system proceeds to step S5.

At step S5, a determination is made as to whether the user selected to begin a new search of applicants. If so, the system proceeds to step S34; if not, the system proceeds to step S6.

At step S6, a determination is made as to whether the user selected to continue a previously suspended search of applicants. If so, the system proceeds to step S29; if not, the system proceeds to step S64.

At step S7, a determination is made as to whether it is time for an applicant to update the information they have provided to the server. If so, the system proceeds to step S8; if not, the system proceeds to step S9.

At step S8, the server notifies applicants that it is recommended that they update their resumé information. After performing step S8, the system proceeds to step S9.

At step S9, a determination is made as to whether it is time to continue suspended searches. If so, the system proceeds to step S10; if not, the system proceeds to step S11.

At step S10, suspended searches are performed. After performing step S10, the system proceeds to step S11.

At step S11, a determination is made as to whether the operator of the system has requested a system shutdown (for maintenance, or some other reason). If so, the system shuts down; if not, the system proceeds to step S1.

At step S12, a new applicant identification number is assigned by the server, and the server sends to the client a request for a selection of a password. After performing step S12, the system proceeds to step S13.

At step S13, the system receives a response from the client. After performing step S13, the system proceeds to step S14.

At step S14, the server prepares an empty resumé outline form. After performing step S14, the system proceeds to step S15.

At step S15, the server sends the resumé outline form to the connected client, and requests that the applicant fill out the form. After performing step S15, the system proceeds to step S16.

At step S16, the server receives the response from the client. After performing step S16, the system proceeds to step S17.

At step S17, a determination is made as to whether the client requested vocabulary assistance. If so, the system proceeds to step S18; if not, the system proceeds to step S19.

At step S18, the requested vocabulary assistance information is added to the resumé outline form. An example of vocabulary assistance is shown in FIG. 6. For example, if an applicant has listed cellular and satellite in the job title field, and requests vocabulary assistance for the job title field, the server will generate a list of alternative terms such as development, firmware, software, and systems, and will transmit that list to the applicant's client machine. The client can then select any of the listed vocabulary assistance terms for addition to the job title field. Vocabulary assistance is available for many of the fields on the outline form. After performing step S18, the system proceeds to step S15.

At step S19, the server stores the information filled in the resumé outline form in the database After performing step S19, the system proceeds to step S20.

At step S20, the server sends to the client a list of available resumé image reception methods and requests that the applicant select a method. After performing step S20, the system proceeds to step S21.

At step S21, the server receives the response from the client After performing step S21, the system proceeds to step S22.

At step S22, the server prepares to receive the resumé image from the client using the selected reception method. After performing step S22, the system proceeds to step S23.

At step S23, the server receives the resumé image. After performing step S23, the system proceeds to step S24.

At step S24, the server stores the resumé image in the database. After performing step S24, the system proceeds to step S2.

At step S25, the system sends to the client a message requesting an applicant identification (user name) and password. After performing step S25, the system proceeds to step S26.

At step S26, the server receives and verifies the password and ID. After performing step S26, the system proceeds to step S27.

At step S27, the server retrieves the existing resumé outline information from the database for this applicant. After performing step S27, the system proceeds to step S28.

At step S28, the server fills the empty resumé outline form with the outline information retrieved from the database After performing step S28, the system proceeds to S15.

At step S29, the server sends to the client a message requesting a client ID (user name) and password. After performing step S29, the system proceeds to step S30.

At step S30, the server receives and verifies the ID and password. After performing step S30, the system proceeds to step S31.

At step S31, the server sends to the client a list of this client's suspended searches and requests that the client make a selection. After performing step S31, the system proceeds to step S32.

At step S32, the server receives the selection from the client. After performing step S32, the system proceeds to step S33.

At step S33, the server fills the empty resumé outline form with selected search criteria for the suspended search which was selected for execution. After performing step S33, the system proceeds to step S35.

At step S34, the server prepares an empty resumé outline form. After performing step S34, the system proceeds to step S35.

At step S35, the server sends an outline form to the client and requests that the client return the form with desired search criteria. After performing step S35, the system proceeds to step S36.

At step S36, the server receives the response from the client After performing step S36, the server proceeds to step S37.

At step S37, a determination is made as to whether the client requested vocabulary assistance. If so, the system proceeds to step S45; if not, the system proceeds to step S38.

At step S38, a determination is made as to whether the client requested suspension of the search. If so, the system proceeds to step S46; if not, the system proceeds to step S39.

At step S39, the server searches the database of existing resumé outline information After performing step S39, the system proceeds to step S40.

At step S40, the server summarizes compliant resumé outlines, sends the summarized outlines to the client, and requests desired action. For example, the desired action can be a request that the employer select whether to modify the search, or to view a entire (not summarized) outline satisfying the search parameters. After performing step S40, the system proceeds to step S41.

At step S41, the server receives the response from the client. After performing step S41, the system proceeds to step S42.

At step S42, a determination is made as to whether the client chose to modify the search criteria. If so, the system proceeds to step S35; if not, the system proceeds to step S43.

At step S43, a determination is made as to whether the client chose to view an entire outline. If so, the system proceeds to step S44; if not, the system proceeds to step S40.

At step S44, the server sends to the client a list of available resumé outline delivery methods, and request selection by the client. After performing step S44, the system proceeds to step S49.

At step S45, requested vocabulary assistance is added to the resumé outline form. After performing step S45, the system proceeds to step S35.

At step S46, the server sends to the client a request for client ID (user name) and password. After performing step S46, the system proceeds to step S47.

At step S47, the server receives and verifies the client ID and password. After performing step S47, the system proceeds to step S48.

At step S48, the server stores the search criteria. After performing step S48, the system proceeds to step S2.

At step S49, the server receives the response from the client. After performing step S49, the system proceeds to step S50.

At step S50, the server sends a complete resumé outline to the client. By "complete resumé outline", what is meant is non-summarized information, in a format such as is shown in FIG. 3, except with contact information suppressed. After performing step S50, the system proceeds to step S51.

At step S51, a determination is made as to whether the client chose to purchase the resumé image associated with the resumé outline that matched the search criteria. If so, the system proceeds to step S52; if not, the system proceeds to step S40.

At step S52, the server sends to the client a message asking if the employer has an existing account. After performing step S52, the system proceeds to step S53.

At step S53, the server receives the response from the client. After performing step S53, the system proceeds to step S54.

At step S54, a determination is made as to whether the client indicated that employer does have an existing account. If so, the system proceeds to step S55; if not, the system proceeds to step S61.

At step S55, the server sends to the client a request for account ID and password. After performing step S55, the system proceeds to step S56.

At step S56, the server receives and verifies the response. After performing step S56, the system proceeds to step S57.

At step S57, the server sends to the client a list of available resumé image delivery methods, and requests selection of one of those methods. After performing step S57, the system proceeds to step S58.

At step S58, the server receives the response from the client. After performing step S58, the system proceeds to step S59.

At step S59, the server retrieves the resumé image from the database. After performing step S59, the system proceeds to step S60.

At step S60, the server delivers the resumé image to the client via the method selected by the employer After performing step S60, the system proceeds to step S40.

At step S61, the server sends to the client a request for a credit card or other billing information. After performing step S61, the system proceeds to step S62.

At step S62, the server receives the response from the client. After performing step S62, the system proceeds to step S63.

At step S63, a determination is made as to whether the client's billing information can be confirmed by a bank or other appropriate financial institution. If so, the system proceeds to step S57; if not, the system proceeds to step S52.

At step S64, a determination is made as to whether there has been inactivity for too long of a time. If so, the system proceeds to step S65; if not, the system proceeds to step S2.

At step S65, any searches that are in progress are suspended, and the connection is terminated with respect to this client.

In compliance with the statute, the invention has been described in language more or less specific as to structural and methodical features. It is to be understood, however, that the invention is not limited to the specific features shown and described, since the means herein disclosed comprise preferred forms of putting the invention into effect. The invention is, therefore, claimed in any of its forms or modifications within the proper scope of the appended claims appropriately interpreted in accordance with the doctrine of equivalents.

We claim:

1. A resumé storage and retrieval system comprising:

a server including a memory, and a database defined in the memory;

an applicant's client machine in selective communication with the server, the server communicating to the applicant's client machine a resumé outline form to be completed by an applicant, the form having a plurality of fields relevant to employment, using which typical information found on a resumé is summarized by an applicant, the applicant's client machine selectively transmitting to the server summary information defined by at least completed fields of the form, as well as a graphics file of a resumé including formatting, font, and pictorial information of a type contained in a traditional paper resumé, the server receiving and storing in the database the graphics file as well as an entry defined by the summary information from the form for the filled in fields, the server associating the summary information entry with the graphics file submitted by the applicant's client machine; and

an employer's client machine in selective communication with the server, the employer's client machine selectively providing a search request to the server and initiating a search of the summary information in the database by defining search parameters by indicating which fields are to be searched for which keywords, the server upon completing the search communicating to the employer's client machine an amount of the summary information for entries that satisfy the search parameters, and querying the employer's client machine as to whether to present graphics files of resumés associated with the entries that satisfy the search parameters.

2. A resumé storage and retrieval system in accordance with claim 1 wherein the server is accessible to the applicant's client machine and the employer's client machine via Internet.

3. A resumé storage and retrieval system in accordance with claim 2 wherein the applicant's client machine includes a World Wide Web browser, wherein the applicant's client machine is connected to the server via the World Wide Web, and wherein the resumé outline form is an HTML form.

4. A resumé storage and retrieval system in accordance with claim 2 wherein the employer's client machine includes a World Wide Web browser, wherein the employer's client machine is connected to the server via the World Wide Web, wherein the server comprises means for sending an HTML search form to the employer's client machine, having fields corresponding to the fields of the outline, adapted to be filled in by an employer and sent to the server, and wherein the server initiates a search of the entries in the database in response to an employer filling and sending the search form.

5. A resumé storage and retrieval system in accordance with claim 1 and further comprising means defining a first communication link between the server and the applicant's client machine, and means defining a second communication link between the server and the employer's client machine.

6. A resumé storage and retrieval system in accordance with claim 5 wherein at least one of the first and second communication links comprises a link type selected from a group consisting of a hard wired connection, a wireless connection, and a modem and telephone line connection.

7. A resumé storage and retrieval system in accordance with claim 1 wherein the resumé outline form includes fields using which contact information including information identifying the name and address of an applicant is supplied to the server, wherein the server comprises contact information suppression means which limits the amount of summary information communicated from the server to the employer's client machine, when the summary information is communicated to the employer's client machine, to information excluding the contact information for the applicant.

8. A resumé storage and retrieval system in accordance with claim 1 wherein the applicant's client machine includes a World Wide Web browser, wherein the applicant's client machine is connected to the server via the World Wide Web, wherein the resumé outline form is an HTML form, and wherein the outline information entry and the graphics file are transmitted from the applicant's client machine to the server via the World Wide Web.

9. A resumé storage and retrieval system in accordance with claim 1 wherein at least one of the graphics file and the summary information entry is transmitted from the appli-

cant's client machine to the server via a protocol selected from a group consisting of File Transfer Protocol, e-mail, X-MODEM, Y-MODEM, Z-MODEM, KERMIT, ASCII, HTML and UUENCODE.

10. A resumé storage and retrieval system in accordance with claim 1 wherein information for entries that satisfy the search parameters is communicated from the server to the employer's client machine via a protocol selected from a group consisting of File Transfer Protocol, e-mail, X-MODEM, Y-MODEM, Z-MODEM, KERMIT, ASCII, HTML and UUENCODE.

11. A resumé storage and retrieval system in accordance with claim 1 and further comprising a scanner in communication with one of the applicant's client machine and the server, and wherein the graphics file is generated by the scanner.

12. A resumé storage and retrieval system in accordance with claim 1 and further comprising a facsimile machine at a location remote from the server, and wherein the graphics file is generated by the facsimile machine.

13. A resumé storage and retrieval system in accordance with claim 1 wherein the server comprises means for storing the search request, and for periodically repeating the search, whereby additional entries can be located in the event the database has been modified and contains new entries that satisfy the search parameters.

14. A resumé storage and retrieval system in accordance with claim 1 wherein the server comprises means for suspending execution of a search request upon receiving a suspend request from the employer's client machine, and for resuming the search at a later time upon receiving a resumé request from the employer's client machine.

15. A resumé storage and retrieval system in accordance with claim 1 wherein the server comprises vocabulary assistance means for assisting an employer in formulating a search request, the vocabulary assistance means providing to the employer's client machine alternative terminology which can be selected for the database search using the employer's client machine.

16. A resumé storage and retrieval system in accordance with claim 1 wherein the server comprises vocabulary assistance means for assisting an applicant in filling the outline form, the vocabulary assistance means providing to the applicant's client machine alternative terminology which can be selected for the outline form using the applicant's client machine.

17. A resumé storage and retrieval system in accordance with claim 1 wherein the server comprises means defining a fee consent flag which is set if the employer client machine sends a consent to pay a fee in response to the server's query as to whether to present graphics files, and means for presenting the graphics files of resumés associated with the entries that satisfy the search parameters if the fee consent flag is set.

18. A resumé storage and retrieval system in accordance with claim 1 wherein the server comprises means defining a fee consent flag which is set if the employer client machine sends a credit card number in response to the server's query as to whether to present graphics files, and means for presenting the graphics files of resumés associated with the entries that satisfy the search parameters to the employer client machine if the fee consent flag is set.

19. A resumé storage and retrieval system in accordance with claim 1 wherein the server comprises means for sending a suggestion to the applicant's client machine that the applicant's graphics file and summary information should be updated, after an amount of time after the graphics file and summary information was added to the database.

20. A resume storage and retrieval system comprising:

a server including a memory, and a database defined in the memory;

the server being in selective communication with an applicant's client machine, the server communicating to the applicant's client machine a resumé outline form to be completed by an applicant, the form having a plurality of fields relevant to employment, using which typical information found on a resumé is summarized by an applicant, the applicant's client machine selectively transmitting to the server summary information for at least some of the fields of the form, as well as a graphics file of a resumé including formatting and pictorial information of a type contained in a traditional paper resumé, the server receiving and storing in the database the graphics file as well as an entry defined by the summary information from the form for the filled in fields, the server associating the entry of summary information with the graphics file submitted by the applicant's client machine;

the server being in selective communication with an employer's client machine, the employer's client machine selectively initiating a search of the summary information in the database by indicating which fields are to be searched for which keywords, the server upon completing the search communicating to the employer's client machine an amount of the summary information for entries that satisfy the search parameters, and querying the employer's client machine as to whether to present graphics files of resumés associated with the entries that satisfy the search parameters.

21. A method carried out by a server including a memory, and including a database defined by the memory, the method comprising:

communicating to a first machine a resumé outline form having a plurality of fields relevant to employment, using which typical information found on an applicant's resumé is summarized by a user;

receiving summary information for at least some of the fields of the form;

receiving a graphics file of a resumé including formatting and pictorial information of a type contained in a traditional paper resumé;

storing in a database the graphics file as well as an entry defined by the summary information from the form for the filled in fields, the server associating the summary information entry with the graphics file submitted by the first machine;

communicating with an employer's client machine to receive a search request defined by an indication of which fields are to be searched for which keywords;

performing a search through the entries in the database, searching for the keywords communicated by the employer's client machine in the fields indicated by the employer's client machine;

communicating to the employer's client machine an amount of the summary information for entries that satisfy the search parameters; and

querying the employer's client machine as to whether to present graphics files of resumés associated with the entries that satisfy the search parameters.

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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,758,324

DATED : May 26, 1998

INVENTOR(S) : Richard L. Hartman, Mary M. Hartman, Roy P. Massena

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 2, line 4, replace "intent" with --intent.--.
Column 3, line 34, delete "or".
Column 3, line 45, replace "for" with --of--.
Column 4, line 38, replace "Fig, 1" with --Fig. 1--.
Column 4, line 61, replace "embodiments" with -- embodiment--.
Column 5, line 23, replace "variation s" with --variations--.
Column 7, line 5, replace "employers" with --employers.--.
Column 8, line 54, replace "above" with --above.--.
Column 10, line 50, replace "password" with --password.--.
Column 11, line 14, replace "database" with --database.--.
Column 11, line 21, replace "client" with --client.--.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 5,758,324

DATED : May 26, 1998

INVENTOR(S) : Richard L. Hartman, Mary M. Hartman, Roy P. Massena

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 11, line 43, replace "database" with --database.--.
Column 12, line 4, replace "client" with --client.--.
Column 12, line 14, replace "information" with --information.--.
Column 13, line 22, replace "employer" with --employer.--.

Column 4, line 37, replace "1, Section 8)" with —1, Section 8).—.

Signed and Sealed this

Seventeenth Day of November, 1998

Attest:

BRUCE LEHMAN

Attesting Officer

Commissioner of Patents and Trademarks

US005799268A

United States Patent [19]

Boguraev

[11] Patent Number: 5,799,268

[45] Date f Patent: Aug. 25, 1998

[54] **METHOD FOR EXTRACTING KNOWLEDGE FROM ONLINE DOCUMENTATION AND CREATING A GLOSSARY, INDEX, HELP DATABASE OR THE LIKE**

[75] Inventor: **Branimir K. Boguraev**, Los Gatos, Calif.

[73] Assignee: **Apple Computer, Inc.**, Cupertino, Calif.

[21] Appl. No.: **314,589**

[22] Filed: **Sep. 28, 1994**

[51] **Int. Cl.**[6] G06F 17/20; G06F 17/21; G06F 17/28; G06F 17/60

[52] **U.S. Cl.** 704/9; 704/10

[58] **Field of Search** 395/759, 760, 395/761; 704/9, 10; 707/900

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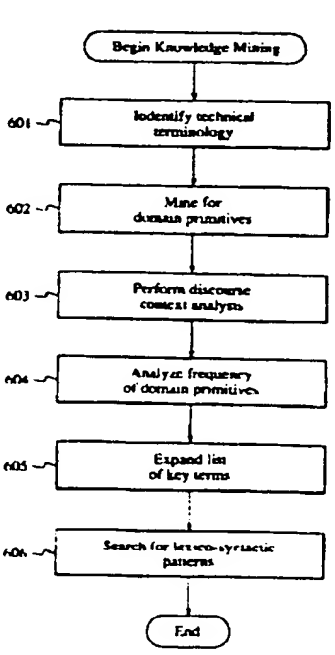
Attorney, Agent, or Firm—Blakley, Sokoloff, Taylor & Zafman

[57] **ABSTRACT**

A method involving computer-mediated linguistic analysis of online technical documentation to extract and catalog from the documentation knowledge essential to, for example, creating a online help database useful in providing online assistance to users in performing a task. The method comprises stripping markup tags from the documentation, linguistically analyzing and annotating the text, including the steps of morphologically and lexically analyzing the text, disambiguating between possible parts-of-speech for each word, and syntactically analyzing and labeling each word. The method further comprises the steps of combining the linguistically analyzed, annotated, and labeled text and previously stripped markup information into a merged file, mining the merged file for domain knowledge, including the steps of identifying and creating a list of technical terminology, mining the merged file for manifestations of domain primitives and maintaining a list of manifestations of such domain primitives in an observations file, analyzing the discourse context of each sentence or phrase in the merged file, analyzing the frequency of manifestations of domain primitives in the observations file to determine those that are important, expanding the list of key terms by searching for terms sanctioned by a domain primitive deemed important in the previous step, and searching the merged file for larger relations by searching for particular lexico-syntactic patterns involving key terms and manifestations of domain primitives previously identified. The method further comprises the steps of structuring the knowledge thus mined and building a domain catalog.

15 Claims, 13 Drawing Sheets



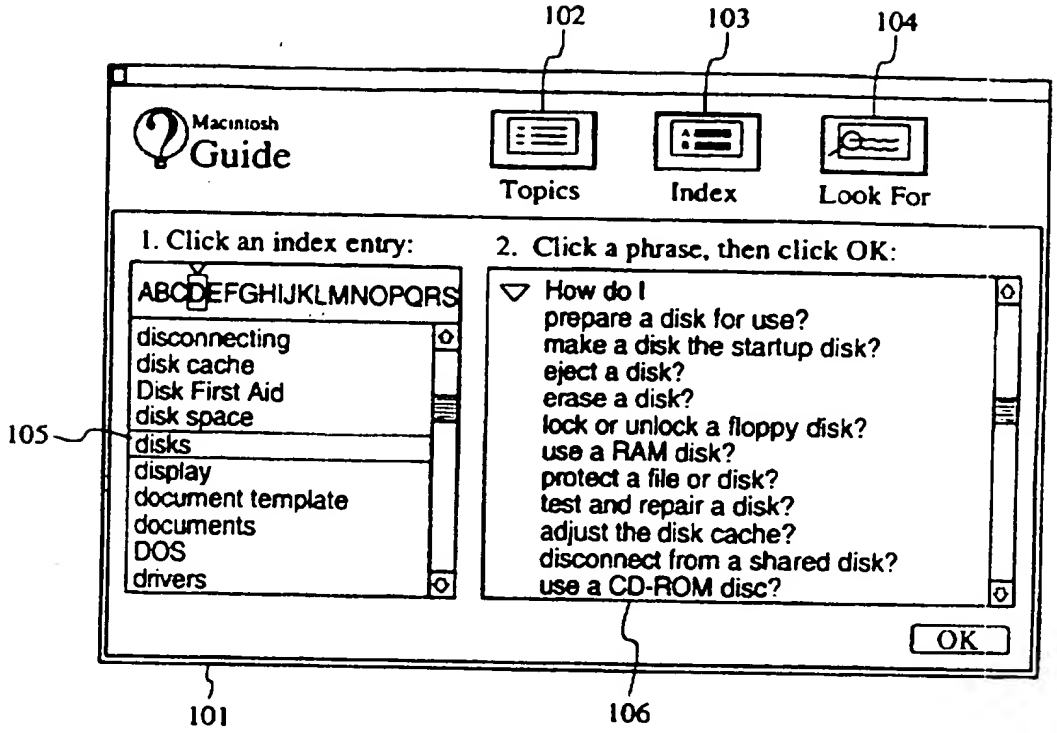

102
103
104
Macintosh Guide
Topics
Index
Look For
1. Click an index entry:
2. Click a phrase, then click OK:
ABCDEFGHIJKLMNOPQRS
disconnecting
disk cache
Disk First Aid
disk space
disks
display
document template
documents
DOS
drivers
How do I
prepare a disk for use?
make a disk the startup disk?
eject a disk?
erase a disk?
lock or unlock a floppy disk?
use a RAM disk?
protect a file or disk?
test and repair a disk?
adjust the disk cache?
disconnect from a shared disk?
use a CD-ROM disc?
OK
105
101
106

FIG. 1

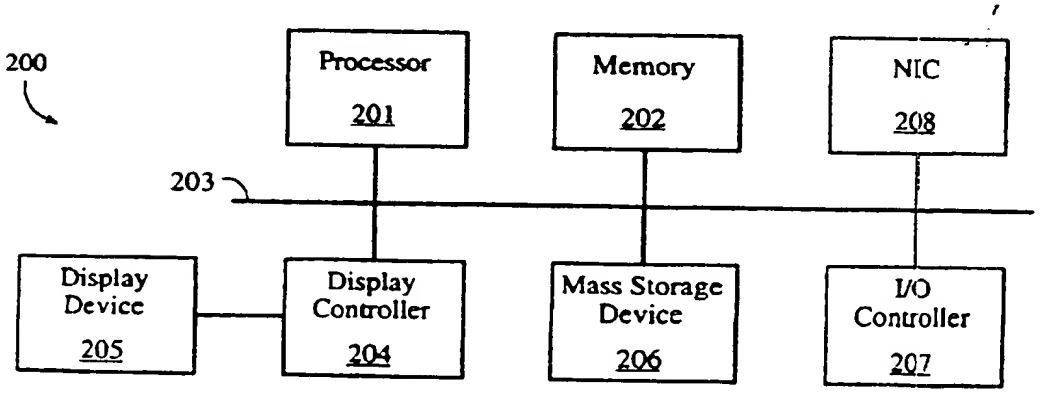

200
Processor
201
Memory
202
NIC
208
203
Display Device
205
Display Controller
204
Mass Storage Device
206
I/O Controller
207

FIG. 2

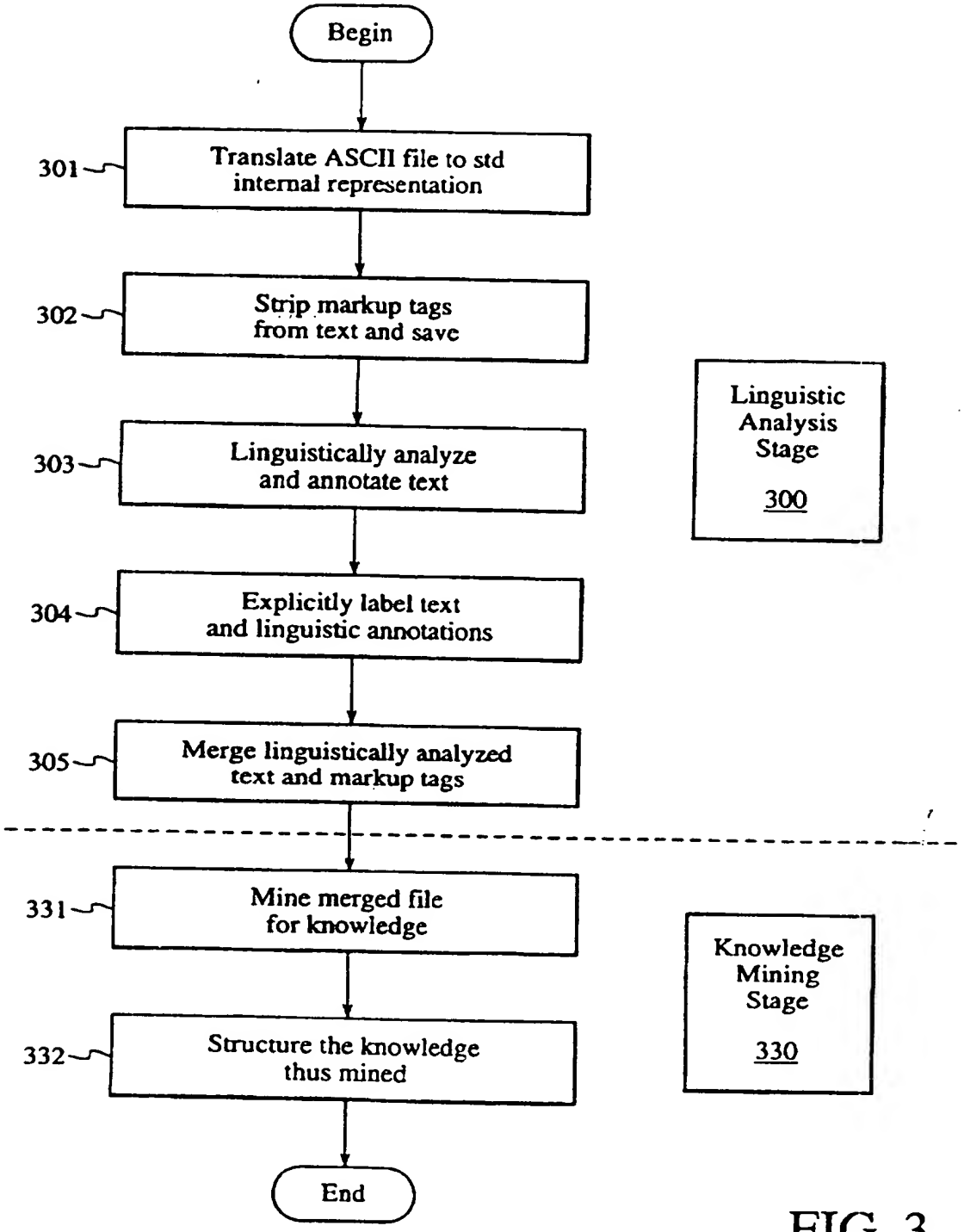

Begin
301
Translate ASCII file to std internal representation
302
Strip markup tags from text and save
303
Linguistically analyze and annotate text
304
Explicitly label text and linguistic annotations
305
Merge linguistically analyzed text and markup tags
Linguistic Analysis Stage
300
331
Mine merged file for knowledge
332
Structure the knowledge thus mined
Knowledge Mining Stage
330
End

FIG. 3

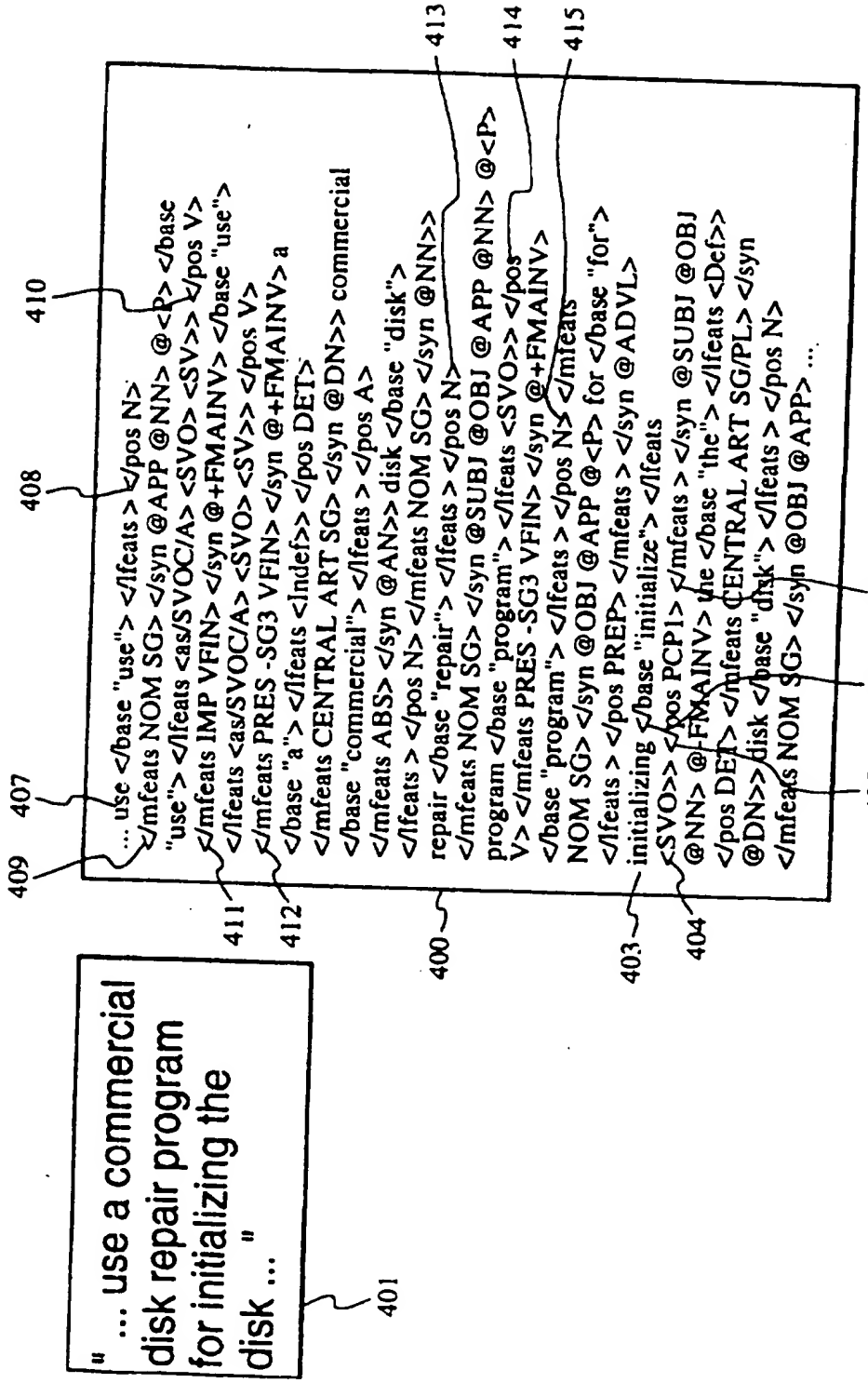

" ... use a commercial disk repair program for initializing the disk ... "
401
... use </base "use"> </lfeats > </pos N>
</mfeats NOM SG> </syn @APP @NN> @<P> </base
"use"> </lfeats <as/SVOC/A> <SVO> <SV>> </pos V>
</mfeats IMP VFIN> </syn @+FMAINV> </base "use">
</lfeats <as/SVOC/A> <SVO> <SV>> </pos V>
</mfeats PRES -SG3 VFIN> </syn @+FMAINV> a
</base "a"> </lfeats <Indef>> </pos DET>
</mfeats CENTRAL ART SG> </syn @DN>> commercial
</base "commercial"> </lfeats > </pos A>
</mfeats ABS> </syn @AN>> disk </base "disk">
</lfeats > </pos N> </mfeats NOM SG> </syn @NN>>
repair </base "repair"> </lfeats > </pos N>
</mfeats NOM SG> </syn @SUBJ @OBJ @APP @NN> @<P>
program </base "program"> </lfeats <SVO>> </pos
V> </mfeats PRES -SG3 VFIN> </syn @+FMAINV>
</base "program"> </lfeats > </pos N> </mfeats
NOM SG> </syn @OBJ @APP @<P> for </base "for">
</lfeats > </pos PREP> </mfeats > </syn @ADVL>
initializing </base "initialize"> </lfeats
<SVO>> </pos PCP1> </mfeats > </syn @SUBJ @OBJ
@NN> @-FMAINV> the </base "the"> </lfeats <Def>>
</pos DET> </mfeats CENTRAL ART SG/PL> </syn
@DN>> disk </base "disk"> </lfeats > </pos N>
</mfeats NOM SG> </syn @OBJ @APP> ...
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415

FIG. 4

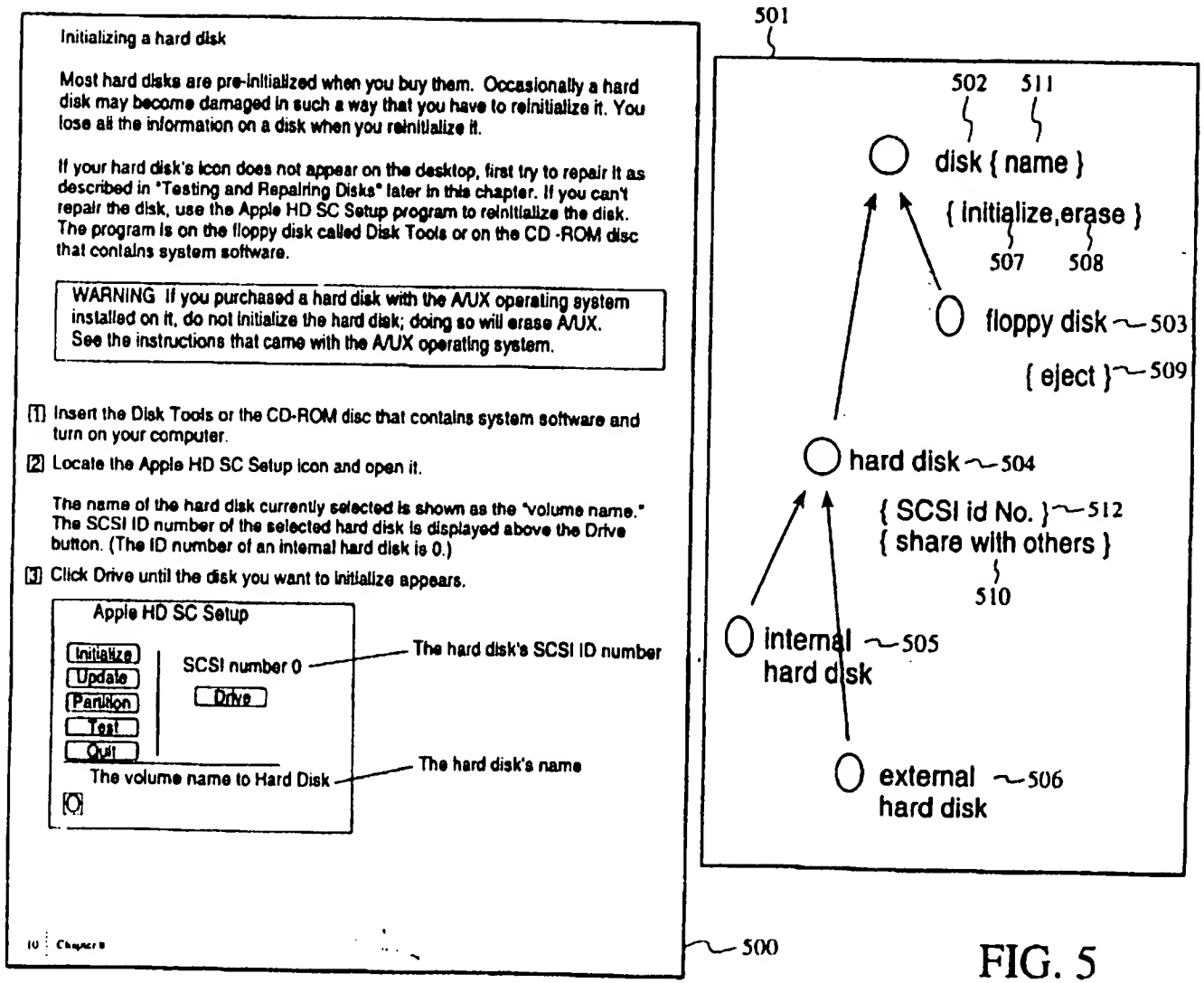

Initializing a hard disk
Most hard disks are pre-initialized when you buy them. Occasionally a hard disk may become damaged in such a way that you have to reinitialize it. You lose all the information on a disk when you reinitialize it.
If your hard disk's icon does not appear on the desktop, first try to repair it as described in "Testing and Repairing Disks" later in this chapter. If you can't repair the disk, use the Apple HD SC Setup program to reinitialize the disk. The program is on the floppy disk called Disk Tools or on the CD-ROM disc that contains system software.
WARNING If you purchased a hard disk with the A/UX operating system installed on it, do not initialize the hard disk; doing so will erase A/UX. See the instructions that came with the A/UX operating system.
[1] Insert the Disk Tools or the CD-ROM disc that contains system software and turn on your computer.
[2] Locate the Apple HD SC Setup icon and open it.
The name of the hard disk currently selected is shown as the "volume name." The SCSI ID number of the selected hard disk is displayed above the Drive button. (The ID number of an internal hard disk is 0.)
[3] Click Drive until the disk you want to initialize appears.
Apple HD SC Setup
Initialize
Update
Partition
Test
Quit
SCSI number 0
Drive
The volume name to Hard Disk
The hard disk's SCSI ID number
The hard disk's name
10 Chapter 8
500
501
502
511
disk { name }
{ initialize,erase }
507
508
floppy disk 503
{ eject } 509
hard disk 504
{ SCSI id No. } 512
{ share with others }
510
internal hard disk 505
external hard disk 506

FIG. 5

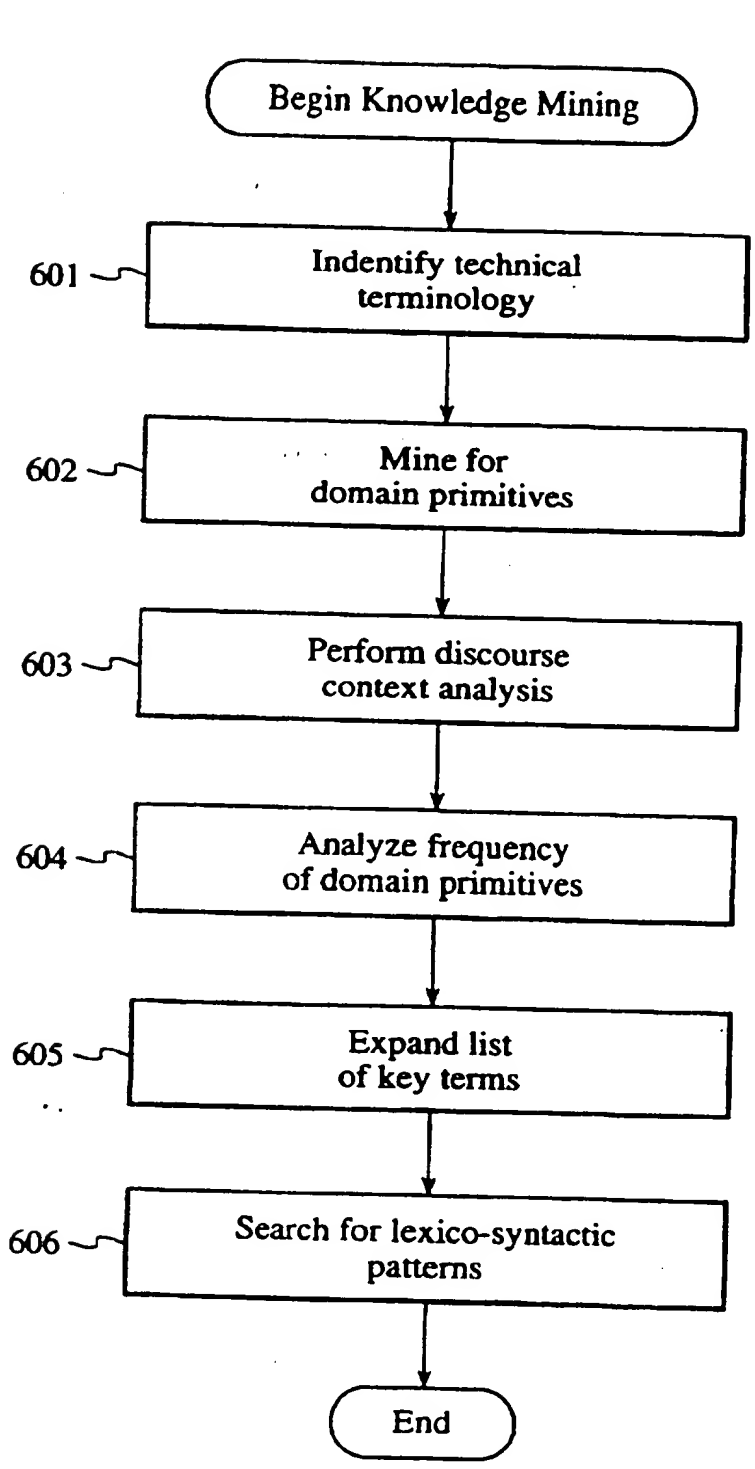
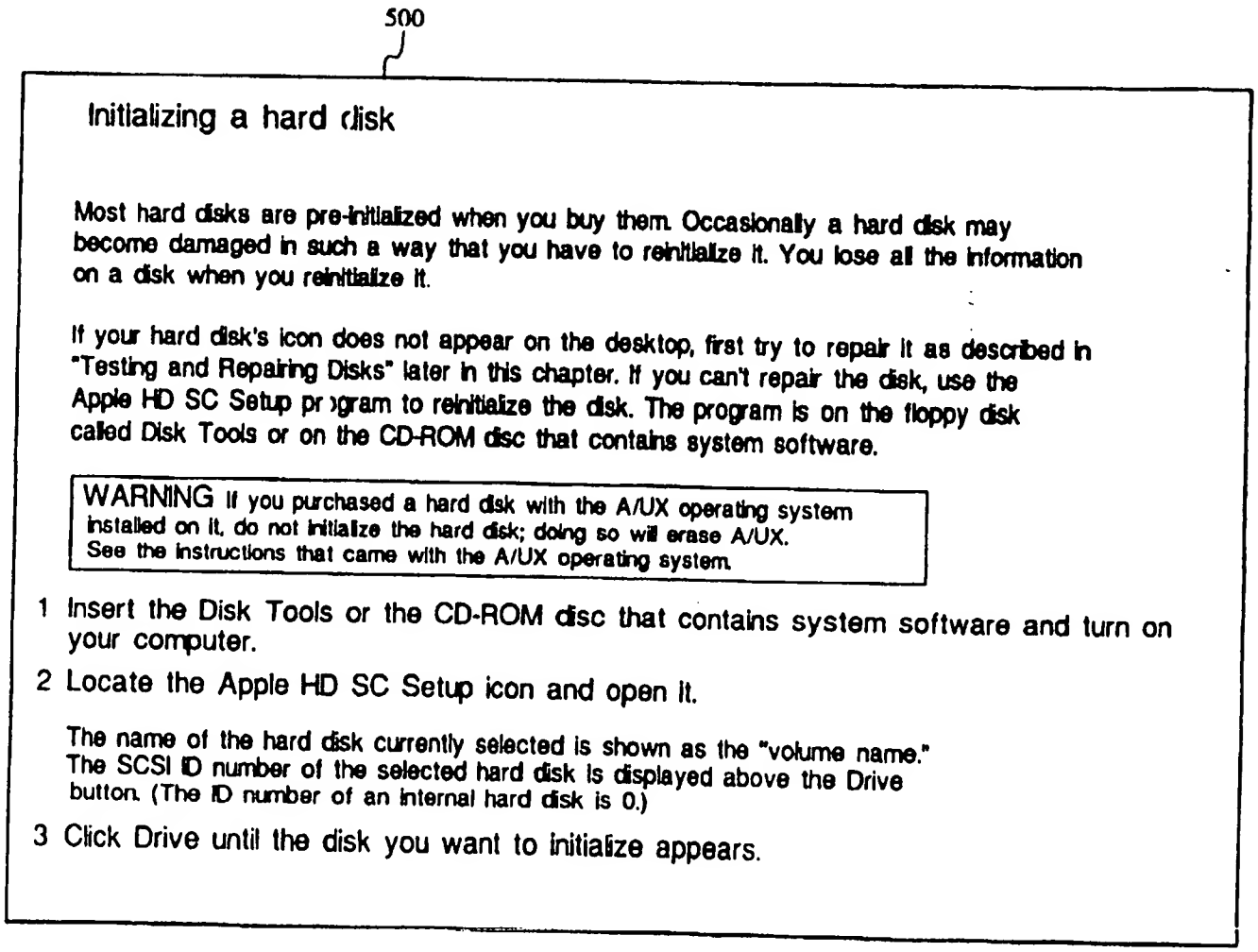

331
Begin Knowledge Mining
601
Indentify technical terminology
602
Mine for domain primitives
603
Perform discourse context analysis
604
Analyze frequency of domain primitives
605
Expand list of key terms
606
Search for lexico-syntactic patterns
End

FIG. 6


500
Initializing a hard disk
Most hard disks are pre-initialized when you buy them. Occasionally a hard disk may become damaged in such a way that you have to reinitialize it. You lose all the information on a disk when you reinitialize it.
If your hard disk's icon does not appear on the desktop, first try to repair it as described in "Testing and Repairing Disks" later in this chapter. If you can't repair the disk, use the Apple HD SC Setup program to reinitialize the disk. The program is on the floppy disk called Disk Tools or on the CD-ROM disc that contains system software.
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1 Insert the Disk Tools or the CD-ROM disc that contains system software and turn on your computer.
2 Locate the Apple HD SC Setup icon and open it.
The name of the hard disk currently selected is shown as the "volume name." The SCSI ID number of the selected hard disk is displayed above the Drive button. (The ID number of an internal hard disk is 0.)
3 Click Drive until the disk you want to initialize appears.

FIG. 7

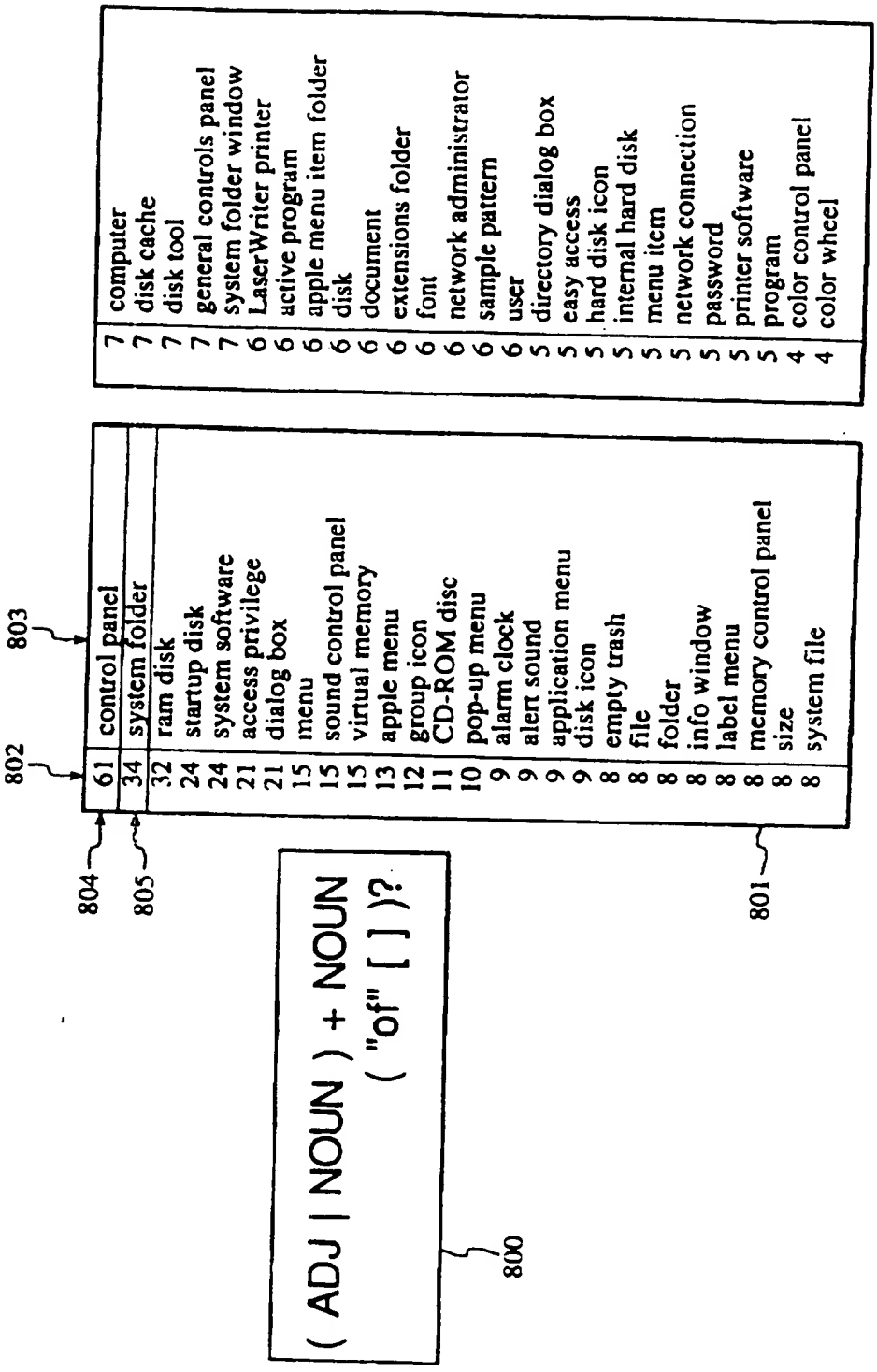
(ADJ | NOUN) + NOUN
("of" [ ])?
800
801
802
803
804
805
61 control panel
34 system folder
32 ram disk
24 startup disk
24 system software
21 access privilege
21 dialog box
15 menu
15 sound control panel
15 virtual memory
13 apple menu
12 group icon
11 CD-ROM disc
10 pop-up menu
9 alarm clock
9 alert sound
9 application menu
9 disk icon
8 empty trash
8 file
8 folder
8 info window
8 label menu
8 memory control panel
8 size
8 system file
7 computer
7 disk cache
7 disk tool
7 general controls panel
7 system folder window
6 LaserWriter printer
6 active program
6 apple menu item folder
6 disk
6 document
6 extensions folder
6 font
6 network administrator
6 sample pattern
6 user
5 directory dialog box
5 easy access
5 hard disk icon
5 internal hard disk
5 menu item
5 network connection
5 password
5 printer software
5 program
4 color control panel
4 color wheel

FIG. 8

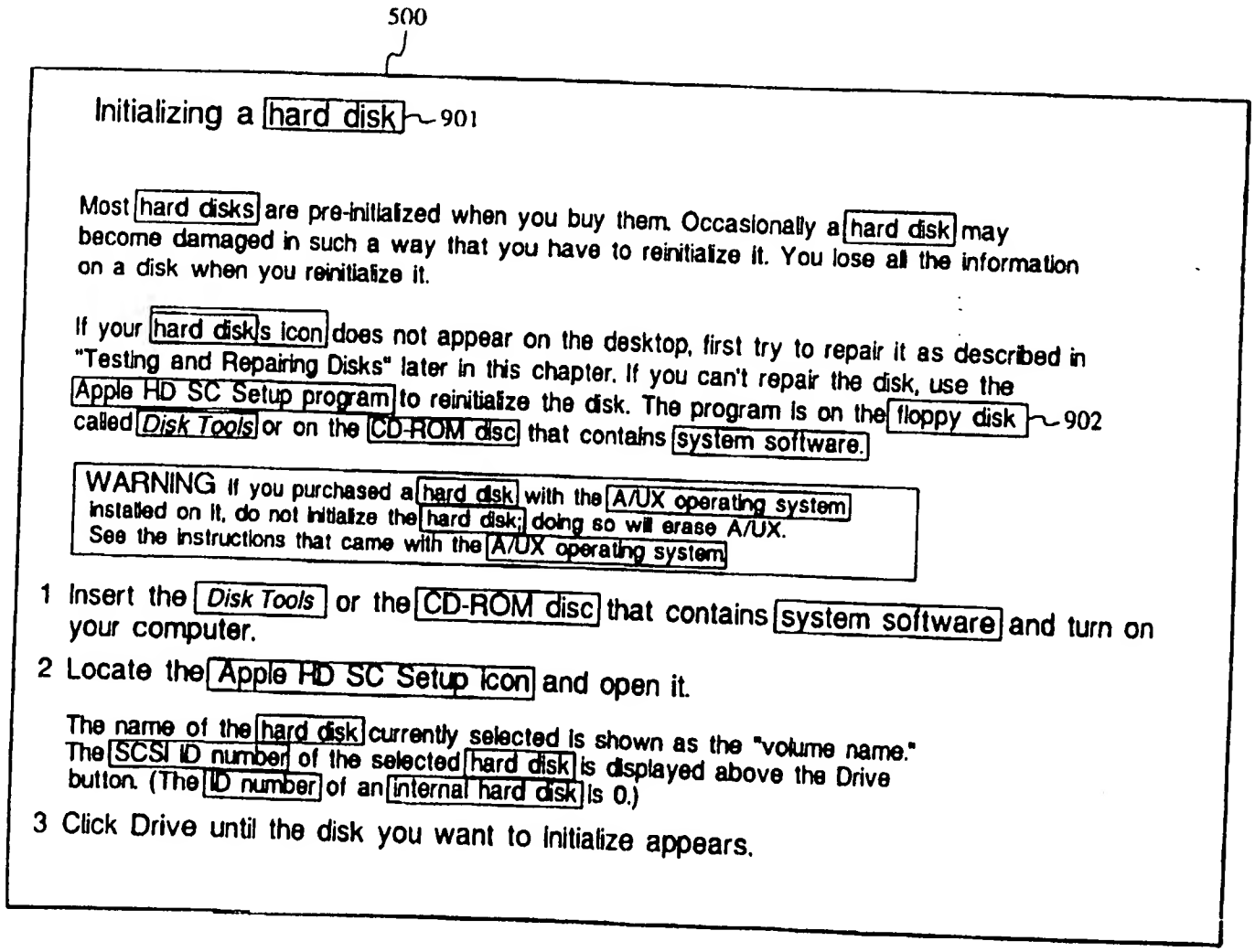
500
Initializing a hard disk
901
Most hard disks are pre-initialized when you buy them. Occasionally a hard disk may become damaged in such a way that you have to reinitialize it. You lose all the information on a disk when you reinitialize it.
If your hard disk's icon does not appear on the desktop, first try to repair it as described in "Testing and Repairing Disks" later in this chapter. If you can't repair the disk, use the Apple HD SC Setup program to reinitialize the disk. The program is on the floppy disk
902
called Disk Tools or on the CD-ROM disc that contains system software.
WARNING If you purchased a hard disk with the A/UX operating system installed on it, do not initialize the hard disk; doing so will erase A/UX. See the instructions that came with the A/UX operating system.
1 Insert the Disk Tools or the CD-ROM disc that contains system software and turn on your computer.
2 Locate the Apple HD SC Setup icon and open it.
The name of the hard disk currently selected is shown as the "volume name." The SCSI ID number of the selected hard disk is displayed above the Drive button. (The ID number of an internal hard disk is 0.)
3 Click Drive until the disk you want to initialize appears.

FIG. 9

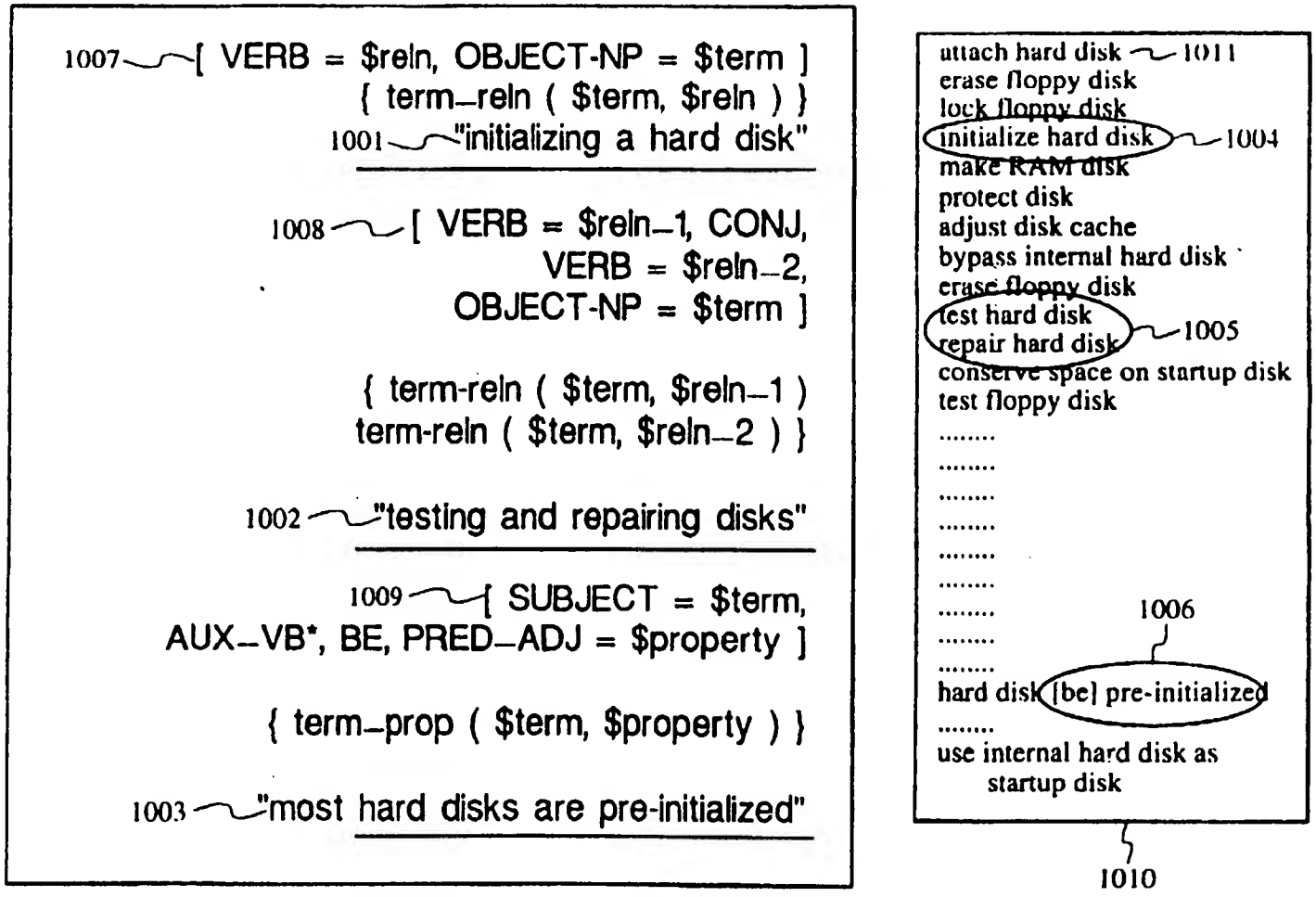
1007
[VERB = $reln, OBJECT-NP = $term]
{ term_reln ($term, $reln) }
1001
"initializing a hard disk"
1008
[VERB = $reln_1, CONJ,
VERB = $reln_2,
OBJECT-NP = $term]
{ term-reln ($term, $reln_1)
term-reln ($term, $reln_2) }
1002
"testing and repairing disks"
1009
[SUBJECT = $term,
AUX_VB*, BE, PRED_ADJ = $property]
{ term_prop ($term, $property) }
1003
"most hard disks are pre-initialized"
uttach hard disk
1011
erase floppy disk
lock floppy disk
initialize hard disk
1004
make RAM disk
protect disk
adjust disk cache
bypass internal hard disk
erase floppy disk
test hard disk
repair hard disk
1005
conserve space on startup disk
test floppy disk
1006
hard disk [be] pre-initialized
use internal hard disk as
startup disk
1010

FIG. 10

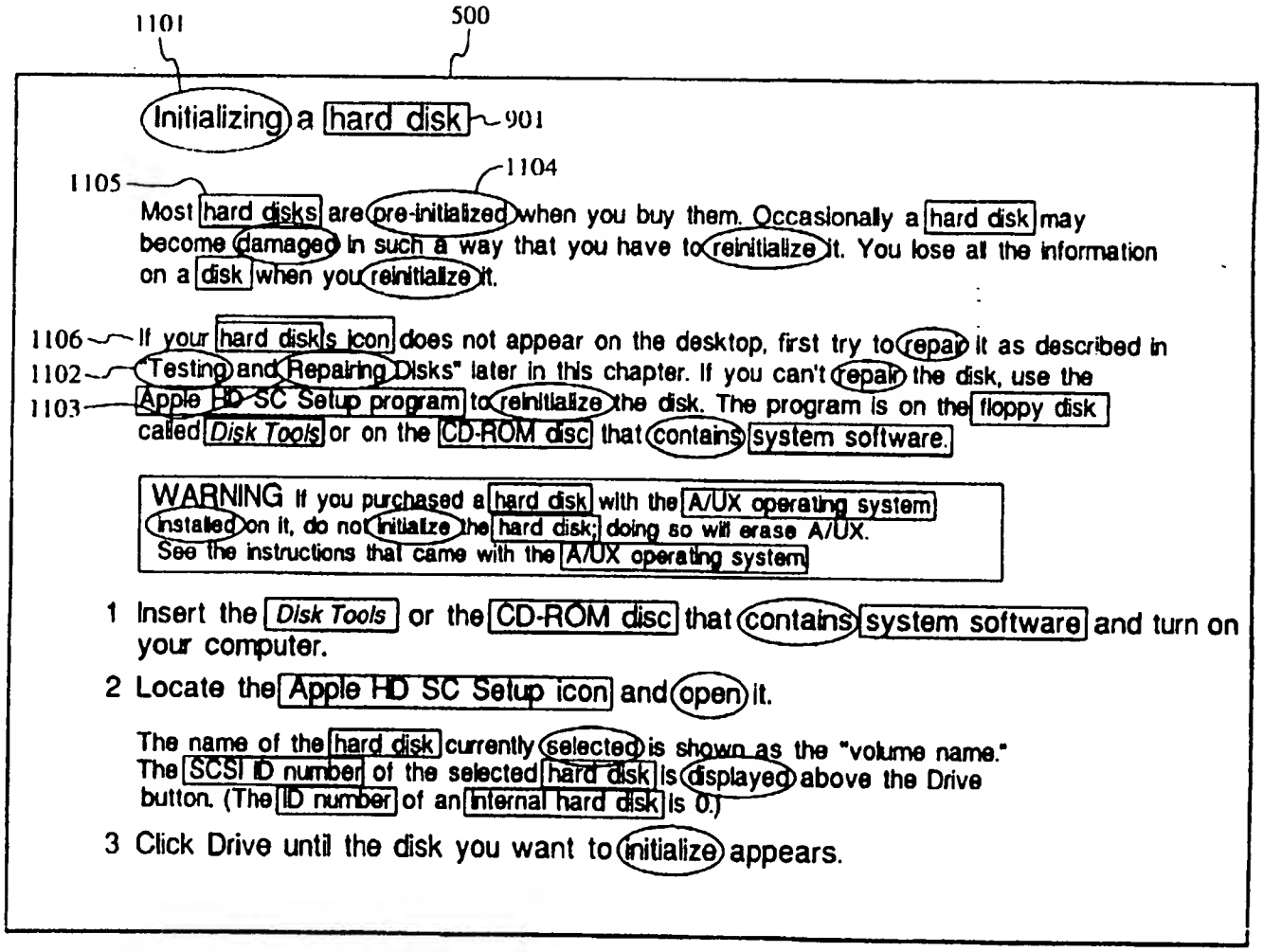
1101
500
Initializing a hard disk
901
1105
1104
Most hard disks are pre-initialized when you buy them. Occasionally a hard disk may become damaged in such a way that you have to reinitialize it. You lose all the information on a disk when you reinitialize it.
1106
If your hard disk's icon does not appear on the desktop, first try to repair it as described in
1102
"Testing and Repairing Disks" later in this chapter. If you can't repair the disk, use the
1103
Apple HD SC Setup program to reinitialize the disk. The program is on the floppy disk called Disk Tools or on the CD-ROM disc that contains system software.
WARNING If you purchased a hard disk with the A/UX operating system installed on it, do not initialize the hard disk; doing so will erase A/UX. See the instructions that came with the A/UX operating system.
1 Insert the Disk Tools or the CD-ROM disc that contains system software and turn on your computer.
2 Locate the Apple HD SC Setup icon and open it.
The name of the hard disk currently selected is shown as the "volume name." The SCSI ID number of the selected hard disk is displayed above the Drive button. (The ID number of an internal hard disk is 0.)
3 Click Drive until the disk you want to initialize appears.

FIG. 11

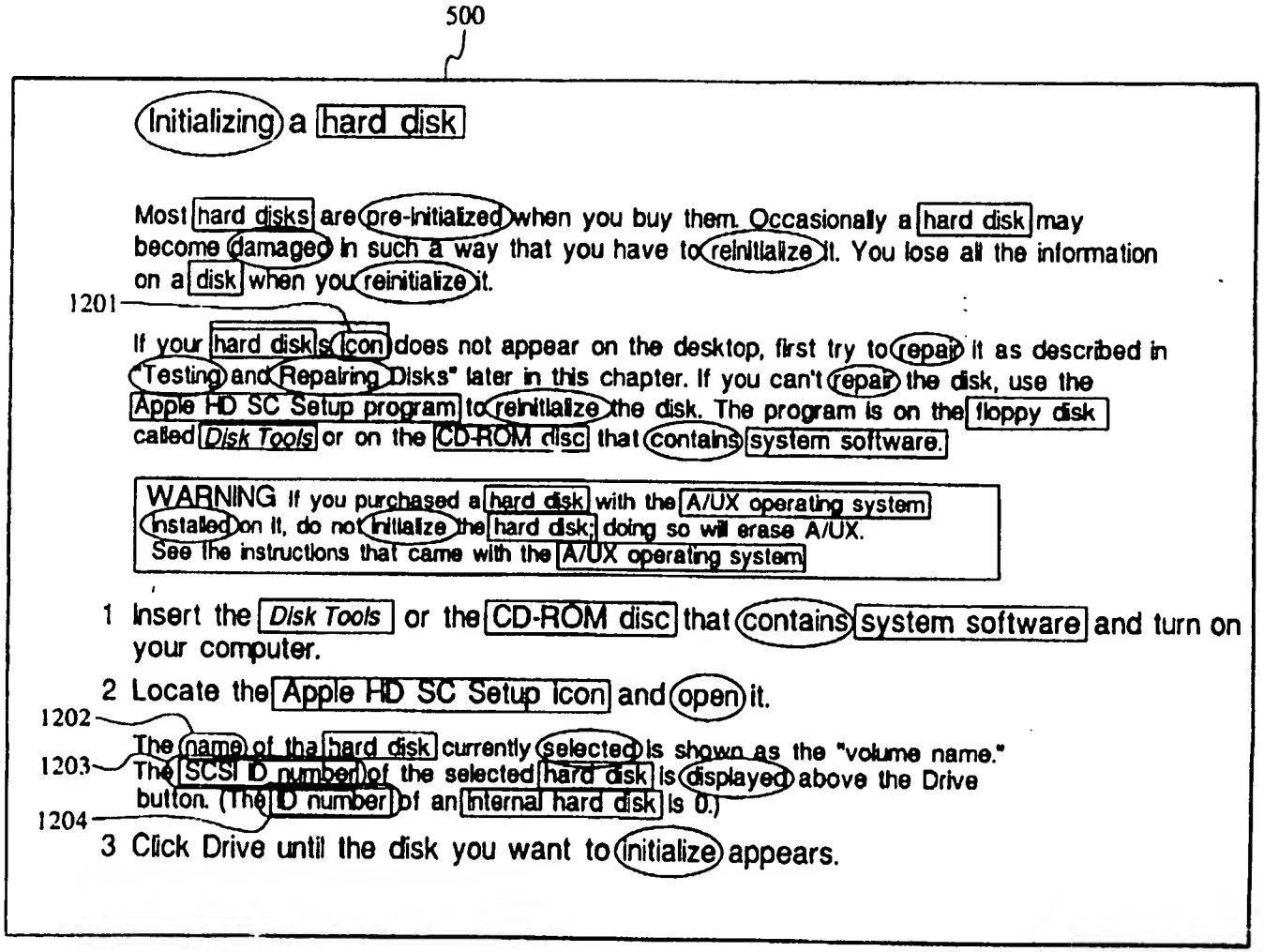
500
Initializing a hard disk
Most hard disks are pre-initialized when you buy them. Occasionally a hard disk may become damaged in such a way that you have to reinitialize it. You lose all the information on a disk when you reinitialize it.
1201
If your hard disk's icon does not appear on the desktop, first try to repair it as described in "Testing and Repairing Disks" later in this chapter. If you can't repair the disk, use the Apple HD SC Setup program to reinitialize the disk. The program is on the floppy disk called Disk Tools or on the CD-ROM disc that contains system software.
WARNING If you purchased a hard disk with the A/UX operating system installed on it, do not initialize the hard disk; doing so will erase A/UX. See the instructions that came with the A/UX operating system.
1 Insert the Disk Tools or the CD-ROM disc that contains system software and turn on your computer.
2 Locate the Apple HD SC Setup icon and open it.
1202
1203
1204
The name of the hard disk currently selected is shown as the "volume name." The SCSI ID number of the selected hard disk is displayed above the Drive button. (The ID number of an internal hard disk is 0.)
3 Click Drive until the disk you want to initialize appears.

FIG. 12

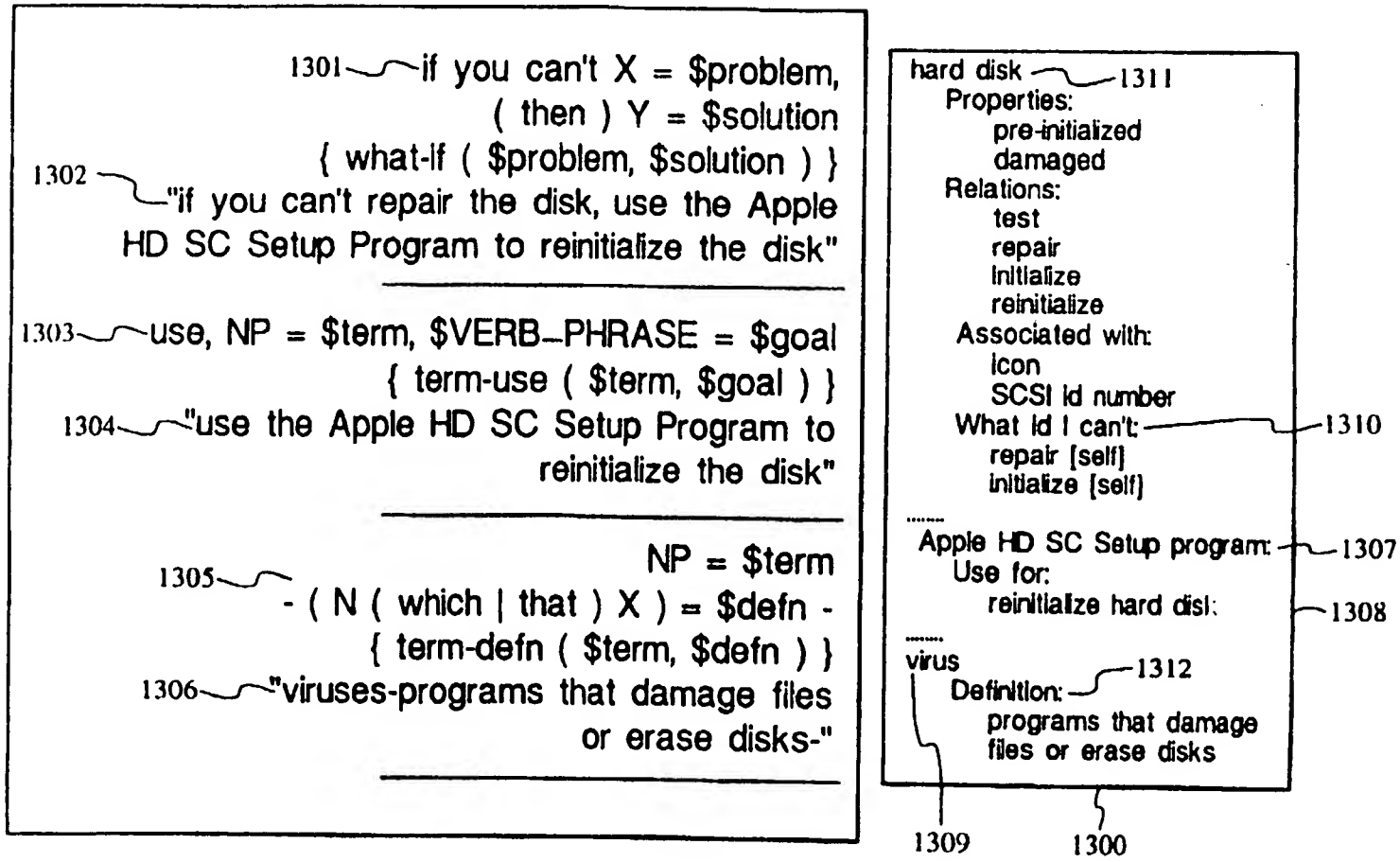
1301
if you can't X = $problem,
(then) Y = $solution
{ what-if ($problem, $solution) }
1302
"if you can't repair the disk, use the Apple HD SC Setup Program to reinitialize the disk"
1303
use, NP = $term, $VERB-PHRASE = $goal
{ term-use ($term, $goal) }
1304
"use the Apple HD SC Setup Program to reinitialize the disk"
1305
NP = $term
- (N (which | that) X) = $defn -
{ term-defn ($term, $defn) }
1306
"viruses-programs that damage files or erase disks-"
hard disk
1311
Properties:
pre-initialized
damaged
Relations:
test
repair
initialize
reinitialize
Associated with:
icon
SCSI Id number
What Id I can't:
1310
repair [self]
initialize [self]
Apple HD SC Setup program:
1307
Use for:
reinitialize hard disl:
1308
virus
1312
Definition:
programs that damage files or erase disks
1309
1300

FIG. 13

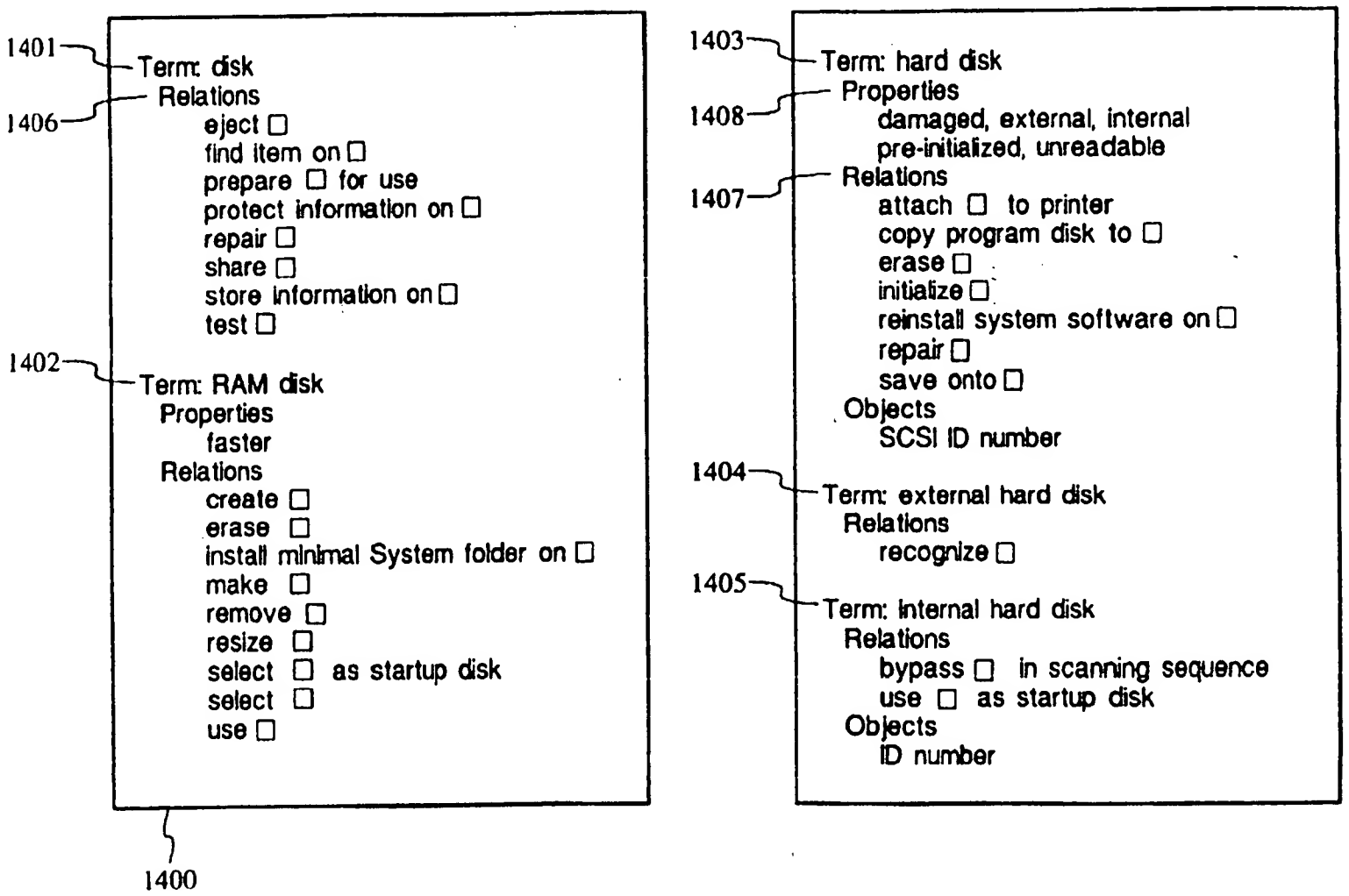
1401
Term: disk
Relations
1406
eject ☐
find item on ☐
prepare ☐ for use
protect information on ☐
repair ☐
share ☐
store information on ☐
test ☐
1402
Term: RAM disk
Properties
faster
Relations
create ☐
erase ☐
install minimal System folder on ☐
make ☐
remove ☐
resize ☐
select ☐ as startup disk
select ☐
use ☐
1400
1403
Term: hard disk
Properties
1408
damaged, external, internal
pre-initialized, unreadable
Relations
1407
attach ☐ to printer
copy program disk to ☐
erase ☐
initialize ☐
reinstall system software on ☐
repair ☐
save onto ☐
Objects
SCSI ID number
1404
Term: external hard disk
Relations
recognize ☐
1405
Term: internal hard disk
Relations
bypass ☐ in scanning sequence
use ☐ as startup disk
Objects
ID number

FIG. 14

METHOD FOR EXTRACTING KNOWLEDGE FROM ONLINE DOCUMENTATION AND CREATING A GLOSSARY, INDEX, HELP DATABASE OR THE LIKE

BACKGROUND OF THE INVENTION

The present invention relates to natural language processing of textual information in a data processing system. Specifically, the invention relates to a process comprising computer-mediated linguistic analysis of online technical documentation and extraction of representative text from the documentation to acquire knowledge essential to, for example, providing assistance to users in performing a task.

Reference books, user guides, instructional manuals, and similar types of technical documentation have long been a main source of background information (as opposed to foreground information, e.g., as found in newspapers) useful to individuals in developing the knowledge necessary to perform some task such as operating an apparatus or item of equipment, for example, a digital computer. The primary purpose of this genre of text is to assist a user of the apparatus to which the material is applicable in operating the apparatus.

More recently, with the proliferation of digital computers in all facets of modern society, and, more specifically, with the advent of desktop computers in the home and the workplace, such assistance has usually taken the form of an online help facility, that is, information useful in assisting the user in performing some task is made available at the user display device of the desktop computer by means of electronic retrieval. This type of assistance is commonly referred to as online assistance or online help. The text of the information may be stored locally in a database file (which may also be referred to as an online help database, or simply, help database) in electronic media on a memory storage device such as a hard disk drive or optical drive coupled to the desktop computer. Alternatively, the text of the information may be stored in a file on a memory storage device coupled to a server which the desktop computer accesses by way of a data network to which the desktop computer, participating as a client in the data network, may be coupled. In either case, the information may be retrieved from the memory storage device and displayed on the user display device as directed by commands input by the user from an input device such as a keyboard, mouse, pen device, etc. In a desktop computing environment, some form of online assistance is provided, usually with respect to some aspect of operating the desktop computer or performing a specific task involving an application program, e.g., a wordprocessor or spreadsheet application.

In the context of online assistance, early versions of assistance generally provide information regarding what tasks or functions can be accomplished with the tools and commands of a computer operating system or software application, and/or what is the proper syntax or procedure for invoking such a command. For example, an early form of online assistance termed Balloon Help (in which explanatory text is displayed in a small pop-up window shaped like the balloons used for dialog in comic strips) is provided on Apple Macintosh computers operating under version System 7 and later versions of the Apple Macintosh Operating System. Using Balloon Help, a user of an Apple Macintosh computer can determine the function of potentially any command, symbol, window, icon, or object visible on the user display device, i.e., the screen of the Apple Macintosh

computer. When a user enables this form of online assistance, short, descriptive text messages appear on the screen describing the function performed by a particular command, symbol, or object whenever the user places the cursor on the command, symbol, or object in question.

More recent versions of online assistance provide a more comprehensive form of online assistance that not only provides assistance regarding functions of objects, but also what tasks can be accomplished with these objects, as well as how to accomplish the tasks. For example, with reference to FIG. 1 a novel metaphor of online assistance termed Apple Guide is provided on Apple Macintosh computers operating under version System 7.5 and later versions of the Apple Macintosh Operating System. Apple Guide provides online interactive instructions in response to user questions. An answer is provided to a user inquiry by leading the user through a series of interactive windows to a window or sequence of panels that contains explanatory text. An online help database behind the Apple Guide user interface provides the explanatory (coaching) text. Referring to FIG. 1, the user may begin the navigation through a series of windows upon selecting assistance by topic **102**, index **103** or "look for" **104** (where an attempt is made to map a free form user query onto an appropriate answer script from the help database) from an access window **101** (here, the Full Access window as displayed by Macintosh Guide). Using Apple Guide, users of an Apple Macintosh computer are able to obtain online assistance in different forms, including task-oriented procedures on a software application's features, tutorials, advanced features for sophisticated users, and reference material of the type found on quick reference cards.

In early versions of online assistance such as the Balloon Help previously described, the process of determining the content of the database file (herein before and after referred to as the help database) in which is stored the text of information that may be retrieved by online assistance is relatively straightforward. Essentially, the content of the help database is governed by the commands that appear on the user display device or that can be invoked by the user from a user input device. It should be noted that the term command is used here to encompass any object through which a user can control the system or application software running on the digital computer, including, for example, a window, icon, symbol, or text string. The creator, or "author" of the help database simply catalogs each command and provides a short description of its function, or the appropriate syntax for invoking the command, thereby providing a complete enumeration of commands arranged systematically with descriptive details.

In the more recent versions of online assistance, the process of determining the content of the online help database is an arduous, time consuming, and iterative task, typically involving a team of instructional designers. Whereas in earlier versions of online assistance, the author simply cataloged all possible commands and the like, in more recent versions of online assistance, the instructional designers or persons acting in that capacity are not provided with such finite boundaries regarding what information is important and, thus, should be included in the help database. Providing online assistance to questions such as, "how do I do this task?" involves more than just cataloging and describing the functionality of every possible command. The designers need to determine, for example, what task-oriented procedures, what tutorials, what advanced features, and what reference material should be included. This process is one of introspection by the instructional designers.

Decisions are made typically on the basis of accumulated experience and intuition acquired primarily by trial and error. One way to proceed is to first determine the key terms in the application domain (which may be composed of one or more words, i.e., which may be phrasal units), the properties thereof, and the relations (i.e., actions) that can be performed on or with the objects defined by the key terms. For example, with reference to FIG. 1, the instructional design team may determine that the term "disk" shown highlighted at **105** in window **101** is important, and thus, should be a key term included in the help database. They may further determine that actions involving the disk such as preparing, ejecting, erasing (displayed in the right half of window **101** at **106**) are sufficiently important to include and relate to the key term disk in the help database. Key terms, as well as relations and properties involving those key terms essentially define the domain, i.e., the topic or application, for which online assistance is being developed. These key terms, relations and properties may be cataloged and then expanded upon in creating the help database. A domain catalog (i.e., a catalog comprising key terms, properties thereof, and relations involving those key terms, which essentially define an application domain) from which the help database is created also provides the basis for a suitable index, list of subtopics, or other means by which a user can initiate an inquiry into the help database. This process of determining the content and index to the help database comprises a substantial, nontrivial component of the design and delivery of online assistance for user tasks. It should be noted that determining the content of the help database essentially comprises the steps of 1) determining the core of key terms, relations and properties involving the key terms, e.g., "disk", "ejecting a disk", and "name of disk", and 2) writing definitions for key terms and their relations, e.g., defining "disk" and describing the sequence for "ejecting a disk". As will be seen, it is the first step of the process of determining the content of the help database to which the present invention is directed.

The same difficulty in determining the content of a online help database to be accessed by an online user assistance facility occurs in other contexts as well. For example, in the publishing industry, determining the content of the index or glossary to a reference manual, textbook, or instructional guide involves the same arduous process of determining the key terms, relations, i.e., actions, and properties which are considered sufficiently important to place into the index or glossary.

In a computing environment, for example, the desktop computer environment referred to earlier, the same difficulty arises when providing online delivery of technical documentation, that is, online access to an electronic copy of the technical documentation itself, not a help database derived therefrom. To provide this feature, a facility must exist for mapping a user query onto the appropriate position in the text in the online documentation. This necessitates, in the very least, the creation of an index or catalog of the type discussed above that additionally possesses a mapping or linking of the key terms, relations and properties to the location, e.g., the chapter or section number, page number, paragraph, and potentially, the line number, in the online text document at which they occur.

In a programming environment where it is desired to exchange information or otherwise communicate in some manner between separate software programs or routines, e.g., a mail program and a calendar program, elicitation of the type and format of information operated on and derivation of the basic processes each application is capable of executing is necessary to develop a set of procedures for successful interapplication or interprocess communication. Here, too, software engineers must determine the key terms, relations and properties of each application in order to design appropriate software procedures for successful communication therebetween.

Finally, although this discussion is not intended to set forth an exhaustive list of the environments in which it is necessary to boil down the technical information to its key terms and relations, another environment to which the same process applies is that of information management involving a digital computer, e.g., a desktop computer. For example, a user has access to a file containing a short technical document. The filename or title associated with the file in which the document is stored may not readily convey its content. Furthermore, the content of the document may not be readily discernible without fully reading the document. A content stamp of the document, on the other hand, contains key terms, relations and properties such that it is clear what the document is generally about, without having to read it to determine its content. By content stamping documents then, one is able to more accurately and efficiently manage information accessible from the desktop, whether the documents reside, for example, on a local hard disk or a hard disk of a server accessible via a data network. However, creating a content stamp requires reading a document to pull out the key information which comprises the stamp.

From the foregoing discussion, it can be seen that it is desirable to develop a method of extracting pertinent information from technical documentation which does not require or rely on the discretion of, for example, a team of instructional designers, and which facilitates the creation of a domain catalog containing the information, i.e., the key terms, properties thereof, and relations (activities related to or involving key terms) of the domain. It is further apparent that this desire for another method of extracting and cataloging pertinent information from technical documentation exists regardless of how this cataloged information is put to use, whether it be to fashion the content of a help database for online user assistance, to create an index or glossary for a reference manual, textbook, or instructional guide, or some other use, including, for example, those uses discussed above.

As will be seen, given online technical documentation, the present invention overcomes the above mentioned difficulty in creating the domain catalog from which, for example, the content of a help database underlying an online assistance tool may be determined and generated.

SUMMARY OF THE INVENTION

Described herein is a method involving computer-mediated linguistic analysis of online technical documentation to extract and catalog from the documentation knowledge essential to, for example, creating a online help database useful in providing online assistance to users in performing a task.

An embodiment of the method for creating a catalog comprising key terms, properties thereof, relations involving those key terms for a given topic, i.e., for a given domain, comprises 1) translating an ASCII data file of online technical documentation having a proprietary internal representation for document structure to a standard internal representation for document structure, for example, a standard internal representation generally conforming with the standard general markup language (SGML), 2) generating a stream of straight ASCII text free of markup information by

stripping and saving markup tags for later processing. 3) linguistically analyzing and annotating the ASCII text, including the steps of: a) lexically and morphologically analyzing each word of the text to determine its possible lexical and morphological features, b) disambiguating between two or more possible parts of speech that each word may take on within the context of the sentence or phrase in which the word appears, and syntactically analyzing and labeling each word of the text, 4) explicitly labeling the text and linguistic annotations of each word as such to facilitate subsequent mining, 5) combining the linguistically analyzed, annotated, and labeled text and the markup tags stripped in step 2 into a merged file, 6) mining the merged file for knowledge, including the steps of: a) identifying and creating a list of technical terminology (primarily multi-token key terms) and the frequency with which each key term occurs by searching for particular syntactic patterns or sequences, b) mining the merged file for manifestations of domain primitives, i.e., looking for terms, relations and properties that are syntactically related to key terms by searching for particular syntactic patterns and maintaining a list of such manifestations of domain primitives in an observations file, c) analyzing the discourse context of each sentence or phrase in the merged file to more accurately record in the observations file the list of manifestations of domain primitives and avoid incorrect analysis of linguistic observations, d) analyzing the frequency of manifestations of domain primitives in the observations file to determine those that are important and those that are not, e) expanding the list of key terms by searching for terms related to a domain primitive deemed important in the previous step by correlating particular syntactic patterns, and f) given the key terms and manifestations of domain primitives already identified in the previous steps, searching the merged file for larger relations by searching for particular lexico-syntactic patterns involving key terms and manifestations of domain primitives previously identified, and 7) structuring the knowledge thus mined, including the steps of: a) clustering key terms for similarity of use on the basis of repeated manifestations of domain primitives occurring in identical or at least similar syntactic contexts, b) clustering key terms on the basis of proximity in terms of their relative position in the text, and c) building the domain catalog by incorporating, for each key term, those observations which are deemed to be important on the basis of frequency of occurrence in the observations file.

By performing linguistic analysis upon online documentation, it is an object of the present invention to facilitate the arduous process of determining and generating the content of a help database useful in delivering online assistance or reference by automatically creating a domain catalog, that is, a list of what information is important to include in the help database, as indicated by the set of key terms, the relations they participate in, and the properties they display in the domain catalog.

Although an embodiment of the present invention, as it is set forth herein below, is described primarily with reference to, or in the context of determining the content of a help database that drives an online assistance tool such as Apple Guide, it should be noted that this context merely provides an illustration of an environment in which the method of the present invention may be applied.

Another object of the present invention is facilitate the process of developing a set of interprocess communication procedures. By applying the linguistic analyses and natural language technologies according to the method of the present invention to the task of determining the set of procedure calls, function calls, subroutines, data structures, variables, arguments, and other components of software routines or applications, it is possible to derive a software library containing a core set of data elements and procedures for exchanging information including such data elements which may be used to develop interapplication or interprocess communication between software routines. In facilitating the interprocess communication software development process, the present invention is able to linguistically analyze and mine for knowledge (i.e., variables, procedure calls, software routines, etc.) the source code of a software application in the same way it would linguistically analyze and mine for pertinent information in an online technical document. The aforementioned and further objects, features and advantages of the present invention will be apparent from the description and figures which follow.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated by way of example and not limitation in the following figures:

FIG. 1 is an example of a online help facility of the kind to which an embodiment of the present invention may be applied.

FIG. 2 is a block diagram of an embodiment of a digital computer system of the present invention.

FIG. 3 is a flow diagram of an embodiment of a method of the present invention.

FIG. 4 is an embodiment of a method step of the present invention.

FIG. 5 is an embodiment of a data structure of the present invention.

FIG. 6 is a flow diagram of an embodiment of a method step of the present invention.

FIG. 7 is a representative page of online technical documentation used by an embodiment of the present invention.

FIG. 8 is a diagram of a syntactic pattern and data structure of an embodiment of a method step of the present invention.

FIG. 9 is an embodiment of a method step of the present invention.

FIG. 10 is a diagram of syntactic patterns and data structure of an embodiment of a method step of the present invention.

FIG. 11 is an embodiment of a method step of the present invention.

FIG. 12 is an embodiment of a method step of the present invention.

FIG. 13 is a diagram of syntactic patterns and data structure of an embodiment of a method step of the present invention.

FIG. 14 is a diagram of a data structure of an embodiment of the present invention.

Reference numerals in all of the accompanying drawings typically are in the form "figure number" followed by two digits, xx; for example, reference numerals on FIG. 1 may be numbered 1xx; on FIG. 2, reference numerals may be numbered 2xx. In certain cases, a reference numeral may be introduced on one drawing and the same reference numeral may be utilized on other drawings to refer to the same item.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

OVERVIEW

The present invention describes a method involving computer-mediated linguistic analysis of online technical

documentation for automatically generating a catalog of pertinent information defining, in a concise formal structure, the domain, i.e., the topic or application about which the online documentation provides detailed background information. In the following description, numerous specific details are set forth describing specific representations of data, specific processing steps, etc., in order to provide a thorough understanding of the present invention. However, it will be apparent to one of ordinary skill in the art to which the present invention pertains, or with which it is most nearly connected, that the present invention may be practiced without the specific details disclosed herein. In other instances, well known systems or processes have not been shown in detail in order not to unnecessarily obscure the present invention.

Referring now to FIG. 2, certain aspects of embodiments of the present invention may be performed by a data processing system, such as a digital computer system. FIG. 2 illustrates such a system. In particular, computer system **200** includes a processor **201** and a memory **202** which are interconnected by a system bus **203**. A display controller **204** and a display device **205** such as a CRT, liquid crystal or plasma display device, are coupled to processor **201** via system bus **203**. A mass storage device **206**, depicted here as a local device which may be a hard disk that stores information in magnetic media or optical media, is coupled to processor **201** and memory **202** through system bus **203**. Typically, a computer system includes input and output devices in addition to a display device. For example, an output device may be a hard copy printer. Numerous input devices are also well known such as keyboards, mice, trackballs, touchpads, and pens. These input devices communicate with processor **201** and memory 202 via a controller such as input/output (I/O) controller **207**. Furthermore, computer system **200** may be linked to other computer systems in a data network via network interface controller **208** in order to transmit and receive information with other computer systems in the data network, for example, in a client/server computing environment.

In a typical embodiment, textual documents such as reference guides, user guides, scientific or technical documents, instructional manuals, etc., may be stored on mass storage device **206** of computer system **200** or another computer system in a data network to which computer system **200**, participating as a client in the data network, may be coupled via network interface controller **208**. This potentially rich source of online background information may be applied directly or indirectly to any one of a number of uses, including, for example, assisting a user in performing some task by allowing the user to access and display the information on display device **205** as directed by commands input by the user from an input device coupled to I/O controller **207**. The documentation might provide the basis for creation of an online help database, thereby providing users with the flexibility to access, and query, the database for assistance.

As was discussed previously, to the extent online assistance is provided, it is generally with respect to the operation of some aspect of computer system **200** or application software installed thereon, e.g., a wordprocessor or spreadsheet application. In such a situation, the textual documents are comprised of computer operating system or application software reference material, e.g., a reference manual or user guide. However, it may be readily envisioned that online textual documentation may be wholly unrelated to the operation of the computer system of application software installed thereon. The technical documentation could provide information on conceivably any science or technology.

In a desktop publishing environment, technical documentation may be authored and formatted on computer system **200**, in which case, an embodiment of the present invention may be utilized, for example, to create the index and/or glossary of terms at the back of the technical book.

Furthermore, the creation of a domain catalog, i.e., a formal structure of the key terms, relations and properties defining the domain or topic to which the documentation is directed, facilitates exploitation of the technical information by user assistance tasks which may somehow rely upon or require such a formal structure. For example, given a technical document available online, a corresponding domain catalog can be used to identify the sections in the document which may be appropriate, i.e., provide information pertaining to the answer of a free format user query. The domain catalog may further provide a direct mapping of the technical vocabulary in the catalog as well as an index to an online help database.

The major difficulty in deriving the content of the domain catalog from the technical documentation is the process of determining exactly what information is sufficiently representative of the technical documentation to comprise the essence, or gist, of the technical document and thus, be included in the catalog. Once this determination is made, the rest of the process of creating, for example, a online help database, is relatively straightforward. An instructional design team may, for each term in the domain catalog, create a definition, check the validity of automatically generated cross-references between related terms, possibly add more cross references, and create descriptions for the actions identified as being related to the terms.

It is the first step of the above process, that of constructing the domain catalog from which the information contained therein may be expanded upon or put to any number of uses, to which an embodiment of the present invention is directed. In bringing a computer-mediated process involving linguistic analysis to bear on the task of constructing a domain catalog, the process is thereby automated. By carrying out appropriate processing of text documenting a given application, a set of key terms and their properties, and actions involving those key terms may be identified. This information may serve as a prompting device, a kind of "crib sheet" to indicate to, for example, the author of a help database the span of topics that will need to be covered for effective online user assistance.

The focus here is on technical documentation because it lends itself well to the natural language technologies employed by the process involving linguistic analysis described herein. Moreover, as an embodiment of the present invention described herein is implemented in the form of a software application executed by a computer system such as computer system **200**, the technical documentation necessarily resides online, that is, it may be retrieved from, for example, mass storage device **206** and provided as input to the software application.

Technical documents represent a well defined genre of text, sharing common features of style, form, content and presentation. As will be seen, acknowledging and accounting for such expository features found in such documentation allows for certain types of linguistic analysis to be applied in a particular way to map the text of a document onto a concise, formal structure of linguistic objects representative of the key terms and their properties, as well as the relations (i.e., actions) between them, found in the domain to which the documentation is directed.

The primary purpose of linguistic processing of an online technical document is to identify and extract important, or key, words or phrases, collectively referred to as key terms, in the text of the document. In an embodiment of the present invention, key terms deemed sufficiently representative of the text are incorporated into what is referred to herein as a lexical network corresponding to the essence of the document. A structure may then be imposed upon the lexical network such that it may be viewed as a conceptual map of the functionality of the domain, i.e., the topic or application, described in the original technical document.

Prior to describing various aspects of the present invention in detail, it should be understood that the present invention is constructed of a cascade of individual linguistic processing modules, so constructed with the goal of extracting from online, background technical documentation lexical knowledge which defines a conceptual map of a domain, as well as represents in a normalized form the functionality of an associated application. In other words, the linguistic processing modules, each of which individually perform a specific task (that in many cases is an analysis or refinement of the output recorded in a previous step of the cascade), collectively determine the key terms, their properties, and the actions related thereto.

Moreover, the present invention involves a number of stages over which the linguistic processing modules span. With reference to FIG. 3, the stages may be loosely grouped into a linguistic analysis stage **300** followed by a knowledge mining stage **330**. The linguistic analysis stage is generally concerned with identifying the parts of speech that make up each sentence or phrase in the online technical documentation, as well as the syntactic function that each word in the sentence is performing, a nontrivial task because of the context sensitive, inherently ambiguous nature of natural language. The knowledge mining stage generally determines what information should be extracted and stored in the domain catalog. By removing, to the extent possible, ambiguity of language in the text during the linguistic analysis stage, the knowledge mining stage has a linguistically rich base from which it can determine what information is to be extracted will relatively less difficulty.

It will be apparent from the following discussion of the present invention that, given online technical documentation, a domain catalog is constructed not by developing an understanding of what knowledge is contained in the document. Understanding the content of the technical documentation would require, inter alia, a level of robust language analysis beyond the power of natural language processing systems today, as well as the kinds of interpretation and reasoning systems still under development by those skilled in the art. Rather, the added value of the natural language technologies embodied in the present invention derives from processing the textual component of online technical documentation to the extent that lexically, syntactically, and otherwise structurally prominent characteristics of the documentation are able to be identified, extracted, and then incorporated by any of the aforesaid uses to which the present invention may be directed. (Importantly, as will be seen, the techniques employed by an embodiment of the present invention detect and exploit a correspondence between semantically important fragments in the domain and the way in which those fragments manifest themselves linguistically, e.g., as a particular syntactic structure with particular discourse properties.) Thus, most of the techniques and technologies described below depend on the availability of online technical documentation in text form. In what follows, an instance of such a piece of text will be simply referred to as a document.

TECHNOLOGICAL BACKGROUND AND NOMENCLATURE

The following natural language technologies implemented in an embodiment of the present invention include the following linguistic capabilities: lexical access, morphological analysis, part-of-speech disambiguation analysis and syntactic function identification.

LEXICAL ACCESS

Lexical access to a substantial core lexicon of English is necessary. A lexicon is a data structure containing a list of base forms of words for a given language, and inflections and derivations thereof. The lexicon should provide syntactic annotations for words (i.e., annotations regarding the way in which a word occurs in a phrase or sentence), at lease for part-of-speech, for example:

display: Noun, Verb

use: Noun, Verb

Furthermore, the lexicon should provide subcategorization frames (i.e., knowledge about the syntactic environments in which a word can validly occur), for example:

display: Noun+Prep [of]; Verb+NP

use: Noun+Prep [of, for]; Verb+NP

Additionally, the lexicon may be augmented with a robust part-of-speech guesser for those words outside the core lexical coverage. For example, even though there might be no explicit listing for "chooser" or "iconization", based on their endings, a reliable guess could be made that these are nouns.

MORPHOLOGICAL PROCESSOR

A morphological processor looks at the formation of each word in the document and attempts to perform a mapping of an inflected word (i.e., a word modified from its base form to mark such distinctions as those of case, gender, number, tense, person, mood or voice) to its base form, for example:

uses→use

ground→ground

ground→grind

A morphological processor further looks at the formation of each word in the document and attempts to perform a mapping of a derivational word (i.e., a word modified from its base form as by the addition of a noninflectional affix) to its base form, for example:

reinitialize→initialize

reinitializing→initialize

The ability to perform morphological processing enables the present invention to, for example, derive:

|initialize| |disk|

from "reinitializing the disk". The morphological processor further returns the possible part-of-speech tags for a word, for example:

uses→use+|NounPlural|

uses→use+|VerbPast|

ground→ground+|Verb|

ground→ground+|NounSingular|

ground→grind+|VerbPast|

PART OF SPEECH TAGGER (FOR LEXICAL DISAMBIGUATION)

The primary function of such a component is to disambiguate among sets of parts-of-speech annotations, i.e., syntactic tags. For example, while every content word in the phrase, "to display files, view by size" would be lexically analyzed and marked both as a noun and a verb, local syntactic context is sufficient to disambiguate between the individual parts-of-speech:

to/[Inf]

display/[Verb]

files/[NounPlural]

view/[Verb]

by/[Prep]

size/[Noun]

SHALLOW SYNTACTIC ANALYZER

Syntactic analysis (parsing) is the process of resolving a sentence into component parts of speech, describing them grammatically, and identifying structural relationships between words and phrases in a sentence. For example, a noun phrase might be made up from a determiner followed by a noun; a verb phrase might be identified as a verb optionally followed by a noun phrase, and a possible sentence structure might be a noun phrase functioning as the subject, followed by a verb phrase, wherein the verb is the main verb of the sentence, and the noun phrase within the verb phrase is the object.

Presently, full syntactic analysis over real instances of text is not feasible due to a number of reasons, including the complexity of the parsing process, the high degree of lexical ambiguity, failure to cope robustly with unfamiliar input items, and inadequate coverage of existing grammatical descriptions of natural language. However, present technology does make it possible, on the basis of locally defined rules for syntactically allowed contexts, to perform a shallow form of syntactic analysis in which certain linguistic annotations of text are possible. Assuming part-of-speech disambiguation analysis has already been performed by, for example, the part-of-speech tagger described above, valid sequences of syntactic tags can be identified, for example, the grammatical sequence [|Det| |Adj|| is highly common, in contrast to [|Adj| |Det||. Furthermore, it is possible to associate the words in a sentence with the syntactic functions they play within the particular context ("@Subject", " Object", "@Complement-Modifier", etc.), as well as indicate the structural constraints between words. For example, the |Adj| proceeding a |Noun| is dominated by that noun; in a sequence of two or more |Noun|s, the rightmost one acts as the head; etc.

Shallow syntactic analysis differs from syntactic analysis in that a complete parse tree representation is not constructed—phrase boundaries are not identified, nor are relationships between phrases recovered. However, individual lexical items are assigned, where appropriate, syntactic functions. For example, as a result of processing the sentence,

The application requires the use of a separate type of layout window for modifying user templates.

"application" would be analyzed as the main subject; "layout" would be tagged as a |Noun| and associated as a dependent (premodifier) to "window"; both "window" and "templates" would be identified as nouns in complement positions, with "use" and "modify" marked as the dominant heads to which, respectively, those nouns act as direct objects. The significance of being able to identify these relationships will be discussed below.

Thus, because natural language is highly complex and ambiguous, full syntactic analysis for an entire language is impossible given present technology. Shallow syntactic analysis, however, is possible. While not developing a complete parse tree, shallow syntactic analysis attempts to identify and generate a pointer to different structures in a sentence, including, but not limited to, for example, a subject, verb, object, complement, adjunct, etc.

DETAILED DESCRIPTION

Referring now to FIG. 3, a detailed description of an embodiment of the present invention follows.

Linguistic Analysis Stage

A data file stored on, for example, mass storage device **206** and containing technical documentation may have been created by any one of a number of commercially available desktop publishing or wordprocessing software applications. The internal representation of the data file is, for the most part, governed by the software application that created the file, e.g., Microsoft Word. Commonly, the various desktop publishing or wordprocessing software applications have their own proprietary internal data representation for keeping track of the various features of a document, e.g., the typographical, visual, and layout characteristics of the document. Natural language processing software cannot adequately deal with the arbitrary format of documents created by different software applications. Thus, the present invention assumes a uniform framework for representing, storing and accessing the document in a way which preserves the majority of typographical, visual and layout information in the data file containing the document. This is accomplished by mapping, or exporting, the document into a stream of ASCII text to which the natural language technologies of the present invention can be applied. This prerequisite is fulfilled according to application-specific means outside the scope of the present invention. Essentially, what this means is that wordprocessing or desktop publishing application software must create an ASCII-based representation of the internal data format. In doing so, typically all that occurs is the internal representation of the file is converted from binary format to ASCII format—markup tags providing information regarding document structure may still be in a proprietary format, e.g., Microsoft Word Rich Text Format (RTF).

Furthermore, in addition to extruding ASCII text from, e.g., a Microsoft Word file containing a document having a proprietary internal representation for document structure (a process which will yield a text corpus), it is essential when

exporting the document, for reasons discussed below, that this text corpus retain the markup information contained therein concerning the logical and physical structure of the document. Not all markup information may be important. The key in retaining markup information is to strip formatting information that is not important but maintain that which is, along with the text to which it applies. Markup information is information in the form of tags interspersed throughout the document which is used to (conceptually) drive a typesetting machine. To the extent there is important textual information in a sentence, there is equally important information in the way the text is visually organized and presented on a page. As will be seen, the fact that a phrase appears in a subject or chapter heading makes it much more important than if it were embedded in the middle of a long paragraph of text, and thus, more likely that it merits incorporation in the domain catalog. Unlike prior art text processing technologies, the present invention seeks to appreciate the context, in linguistic, document layout and structure terms, in which a phrase, e.g., a noun phrase, appears, and thus, markup information should be maintained in the ASCII text stream.

At step **301** in the cascade of individual linguistic processing modules, the present invention translates the data file containing the ASCII text of a document having a proprietary internal representation for document structure (created by application software outside the scope of the present invention as discussed above) to a data file containing the ASCII text of a document having a standard internal representation for document structure, which may, for example, generally conform to SGML (standard general markup language). The purpose of this step is to provide a standard internal representation for document structure information (i.e., markup tags) in the file containing the document, one which is understood by the natural language processes of the present invention. Thus, subsequent modules in the cascade need only understand one standard file format.

An example of a standard file format is set forth below, hereinafter referred to as example A. It can be seen that markup tags containing information such as the beginning and ending of chapter headings, lists and the items listed therein, subsections, paragraphs, and different text typefaces, such as bold or italics, are interspersed throughout the ASCII text. The example is taken from a portion of an online copy of the Apple Macintosh Reference guide, Chapter 1. Additional references herein related to this text document represent output generated at various stages of the cascade of linguistic processing modules using the same source of technical documentation.

-continued

```
</chapter> Setting Up Your Programs </echapter>
</para> This chapter describes how to set up the programs that you use
when you work with your computer. </epara>
</section> Installing your application programs </esection>
</para> Most application programs come on floppy disks, and you install
them by copying them from the floppy disks to your hard disk. Some
programs have special installation instructions. See the documentation
that came with your programs. </epara>
</para> To use your programs most effectively: </epara>
</list>
</item> Put only one copy of each program on your hard disk. Having
more than one copy can cause errors. </eitem>
</item> Whenever you copy a program disk to your hard disk, be
careful not to copy a System Folder. Always check to see what you've
copied, and drag any extra System Folders to the Trash. </eitem>
</item> If a program malfunctions consistently, try installing a fresh copy.
If that does not help, find out from the software manufacturer whether
your version of the program is compatible with the system software
you're using.
</eitem>
</item> Put frequently used programs (or aliases for those programs)
in the Apple menu so you can open the programs more conveniently. See
Chapter 5, "Adapting Your Computer to Your Own Use." </eitem>
</item> To open a program automatically each time you start up, you can
put the program (or its alias) into the Startup Items folder. See Chapter 5,
"Adapting Your Computer to Your Own Use." </eitem>
/elist>
```

EXAMPLE A

As part of this translation process, visual characteristics of the text are mapped to the logical function that the characteristics perform, e.g., red text may indicate a chapter heading, bold text may mean a subsection heading, a string of 12-point Helvetica text may indicate a paragraph of text. This logical function information representing markup information is retained in the form of a tag at the beginning of each record in the data file. Maintaining such logical function information entails, for example, identification of chapter, section, subsection and other headings, as well as parsing of lists and sublists. To reiterate, the rationale behind this is not only that, for example, section and subsection headings are good places to identify technical terms, but more interestingly, the structure of a running discourse of technical text is itself quite revealing with respect to offering clues to information that describe the domain or application to which the content of the document is directed. For example, definitions of terms are typically found at the beginning of introductory paragraphs, section units typically are concerned with describing the functionality of closely related components, and phrases that are emphasized (e.g., by bold or italic font) are clearly important, etc.

As is step **301**, step **302** is primarily a prepatory step in anticipation of step **303** and later steps in the cascade of linguistic processes. Linguistic analysis of text at step **303** assumes the document contains only ASCII text. The markup tags, therefore, must be stripped, as demonstrated in below in example B:

Setting Up Your Programs

This chapter describes how to set up the programs that you use when you work with your computer.

Installing your application programs

Most application programs come on floppy disks, and you install them by copying them from the floppy disks to your hard disk. Some programs have special installation instructions. See the documentation that came with your programs.

To use your programs most effectively:

- Put only one copy of each program on your hard disk. Having more than one copy can cause errors.
- Whenever you copy a program disk to your hard disk, be careful not to copy a System Folder. Always check to see what you've copied, and drag any extra System Folders to the Trash.
- If a program malfunctions consistently, try installing a fresh copy. If that does not help, find out from the software manufacturer whether your version of the program is compatible with the system software you're using.
- Put frequently used programs (or aliases for those programs) in the Apple menu so you can open the programs more conveniently. See Chapter 5, "Adapting Your Computer to Your Own Use."
- To open a program automatically each time you start up, you can put the program (or its alias) into the Startup

Items folder. See Chapter 5. "Adapting Your Computer to Your Own Use."

EXAMPLE B

However, as was previously mentioned, this information is subsequently used by the present invention, so it is not discarded, but saved in a temporary file and merged back into the text stream at a later step in the cascade, as will be discussed below.

The ASCII text free of markup information produced at step **302** is next analyzed with respect to its lexical and morphological content at step **303**. Each word is annotated to include its lexical and morphological features, including a part-of-speech tag for each morphological context, and a possible syntactic label obtained by way of shallow syntactic analysis. For example, with reference to FIG. 4, text phrase **401**, after analysis and annotation, appears as annotated phrase **400**.

Below is an example, hereinafter referred to as example C, of such analysis and annotation as performed on the ASCII text provided in example B. For example, each record is comprised of a word of text and its annotations. Each word appears in its original form as used in the document and its base form, both in double quotes. Lexical annotations follow and are encapsulated by <>. The morphological annotation follows, in uppercase. Where more than one possible part-of-speech tag exists, each tag is shown annotated on a separate row. For example, the word "set" in the sentence "this chapter describes how to set up the programs that you use when you work with your computer", as set forth in the example below, has 6 possible part-of-speech tags: it may be interpreted as, among other things, a past tense verb in finite form (V PAST VFIN), a normal present tense, non third person singular finite verb (V PRES-SG3 VFIN), and a verb in its infinitive form (V INF), etc. The possible syntactic function is provided in the form of syntactic label, if present, and is the last annotation affixed to each word.

```
("<*setting>"
  ("set" <*><SVOC/A><SVO><SVOO><SV><Ptot>PCP1))
("<*up>"
  ("up" <*> PREP)
  ("up" <*> ADV ADVL (@ADVL)))
("<*your>"
  ("you"<*> PRON PERS GEN SG2/PL2 (@GN>)))
("<*programs>"
  ("program"<*> <SVO>V PRES SG3 VFIN (@+FMAINV))
  ("program"<*>N NOM PL))
("<$HEAD>")
("<*this>"
  ("this" <*>DET CENTRAL DEM SG (@DN>))
  ("this" <*>ADV AD-A>(@AD-A>))
  ("this" <*>PRON DEM SG))
("<chapter>"
  ("chapter" N NOM SG))
("<describes>"
  ("describe" <as/SVOC/A><SVO>V PRES SG3 VFIN (@+FMAINV)))
("<how>"
  ("how" <**CLB>ADV WH))
("<to>"
  ("to" PREP)
  ("to" INFMARK>(@INFMARK>)))
("<set>"
  ("set" <SVOC/A><SVO><SVOO><SV><Ptot>PCP2)
  ("set" <SVOC/A><SVO><SVOO><SV><Ptot>V PAST VFIN (@+FMAINV))
  ("set" <SVOC/A><SVO><SVOO><SV><Ptot>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("set" <SVOC/A><SVO><SVOO><SV><Ptot>V IMP VFIN (@+FMAINV))
  ("set" <SVOC/A><SVO><SVOO><SV><Ptot>V INF)
  ("set" <SVOC/A><SVO><SVOO><SV><Ptot>V PRES -SG3 VFIN (@+FMAINV))
  ("set" N NOM SG))
("<up>"
  ("up" PREP)
  ("up" ADV ADVL (@ADVL)))
("<the>"
  ("the" <Def>DET CENTRAL ART SG/PL (@DN>)))
("<programs>"
  ("program" <SVO>V PRES SG3 VFIN (@+FMAINV))
  ("program" N NOM PL))
("<that>"
  ("that" <**CLB>CS (@CS))
  ("that" DET CENTRAL DEM SG (@DN>))
  ("that" ADV AD-A>(@AD-A>))
  ("that" PRON DEM SG)
  ("that" "<NonMod><**CLB><Rel>PRON SG/PL))
("<you>"
  ("you" <NonMod>PRON PERS NOM SG2/PL2)
  ("you" <NonMod>PRON PERS ACC SG2/PL2))
("<use>"
  ("use" N NOM SG)
  ("use" "<as/SVOC/A><SVO><SV>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("use" "<as/SVOC/A><SVO><SV>V IMP VFIN (@+FMAINV))
  ("use" "<as/SVOC/A><SVO><SV>V INF)
  ("use" "<as/SVOC/A><SVO><SV>V PRES -SG3 VFIN (@+FMAINV)))
("<when>"
```

-continued

```
  ("when" "<**CLB>ADV WH (  ADVL)))
("<you>"
  ("you" <NonMod>PRON PERS NOM SG2/PL2)
  ("you" <NonMod>PRON PERS ACC SG2/PL2))
("<work>"
  ("work" "<SV><SVO><Pfin><Proc>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("work" "<SV><SVO><Pfin><Proc>V IMP VFIN (@+FMAINV))
  ("work" "<SV><SVO><Pfin><Proc>V INF)
  ("work" "<SV><SVO><Pfin><Proc>V PRES -SG3 VFIN (@+FMAINV))
  ("work" N NOM SG))
("<with>"
  ("with" PREP))
("<your>"
  ("you" PRON PERS GEN SG2/PL2 (@GN>)))
("<computer>"
  ("computer" <DER:er>N NOM SG))
("<$.>")
("<*installing>"
  ("install" <*><SVO>PCP1))
("<your>"
  ("you" PRON PERS GEN SG2/PL2 (@GN>)))
("<application>"
  ("application" N NOM SG))
("<programs>"
  ("program" <SVO>V PRES SG3 VFIN (@+FMAINV))
  ("program" N NOM PL))
("<$HEAD>")
("<most>"
  ("much" "<*>ADV SUP)
  ("much" "<*><Quant>PRON SUP SG)
  ("much" "<*><Quant>DET POST SUP SG (@QN>))
  ("many" "<*><Quant>PRON SUP PL)
  ("many" "<*><Quant>DET POST SUP PL (@QN>)))
("<application>"
  ("application" N NOM SG ))
("<programs>"
  ("program" <SVO>V PRES SG3 VFIN (@+FMAINV))
  ("program" N NOM PL))
("<come>"
  ("come" <SVC/A><SV><Pfin>PCP2)
  ("come" <SVC/A><SV><Pfin>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("come" <SVC/A><SV><Pfin>V IMP VFIN (@+FMAINV))
  ("come" <SVC/A><SV><Pfin>V INF)
  ("come" <SVC/A><SV><Pfin>V PRES -SG3 VFIN (@+FMAINV)))
("<on>"
  ("on" PREP)
  ("on" ADV ADVL (@ADVL)))
("<floppy_disks>"
  ("floppy_disk" N NOM PL))
("<$\>")
("<and>"
  ("and" CC (@CC)))
("<you>"
  ("you" <NonMod>PRON PERS NOM SG2/PL2)
  ("you" <NonMod>PRON PERS ACC SG2/PL2))
("<install>"
  ("install" <SVO>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("install" <SVO>V IMP VFIN (@+FMAINV))
  ("install" <SVO>V INF)
  ("install" <SVO>V PRES -SG3 VFIN (@+FMAINV)))
("<them>"
  ("they" <NonMod>PRON PERS ACC PL3))
("<by>"
  ("by" PREP)
  ("by" ADV ADVL (@ADVL)))
("<copying>"
  ("copy" <SVO><SV><Prog>PCP1))
("<them>"
  ("they" <NonMod>PRON PERS ACC PL3))
("<from>"
  ("from" PREP))
("<the>"
  ("the" <Def>DET CENTRAL ART SG/PL (@DN>)))
("<floppy_disks>"
  ("floppy_disk" N NOM PL))
("<to>"
  ("to" PREP)
  ("to" INFMARK>(  INFMARK>)))
("<your>"
  ("you" PRON PERS GEN SG2/PL2 (@GN>)))
```

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```
("<hard_disk>"
  ("hard_disk" N NOM SG))
("<$.>")
("<*some>"
  ("some" <*><Quant>DET CENTRAL SG/PL (@QN>))
  ("some" <*>ADV)
  ("some" <*><NonMod><Quant>PRON SG/PL))
("<programs>"
  ("program" <SVO>V PRES SG3 VFIN (@+FMAINV))
  ("program" N NOM PL))
("<have>"
  ("have" <SVO><SVOC/A>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("have" <SVO><SVOC/A>V PRES -SG3 VFIN)
  ("have" <SVO><SVOC/A>V INF)
  ("have" <SVO><SVOC/A>V IMP VFIN (@+FMAINV)))
("<special>"
  ("special" A ABS))
("<installation>"
  ("installation" N NOM SG ))
("<instructions>"
  ("instruction" N NOM PL))
("<$.>")
("<*see>"
  ("see" <*><as/SVOC/A><SVO><SV><InfComp>V SUBJUNCTIVE VFIN (@+FMAINV)
)
  ("see" <*><as/SVOC/A><SVO><SV><InfComp>V IMP VFIN (@+FMAINV))
  ("see" <*><as/SVOC/A><SVO><SV><InfComp>V INF)
  ("see" <*><as/SVOC/A><SVO><SV><InfComp>V PRES -SG3 VFIN (@+FMAINV)))
("<the>"
  ("the" <Def>DET CENTRAL ART SG/PL (@DN>)))
("<documentation>"
  ("documentation" <-Indef>N NOM SG))
("<that>"
  ("that" <**CLB>CS (@CS))
  ("that" DET CENTRAL DEM SG (@DN>))
  ("that" ADV AD-A>(@AD-A>))
  ("that" PRON DEM SG)
  ("that" <NonMod><**CLB><Rel>PRON SG/PL))
("<came>"
  ("come" <SVC/A><SV><Pfor>V PAST VFIN (@+FMAINV)))
("<with>"
  ("with" PREP))
("<your>"
  ("you" PRON PERS GEN SG2/PL2 (@GN>)))
("<programs>"
  ("program" <SVO>V PRES SG3 VFIN (@+FMAINV))
  ("program" N NOM PL))
("<$.>")
("<*to>"
  ("to" <*>PREP)
  ("to" <*>INFMARK>(@INFMARK>)))
("<use>"
  ("use" N NOM SG)
  ("use" <as/SVOC/A><SVO><SV>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("use" <as/SVOC/A><SVO><SV>V IMP VFIN (@+FMAINV))
  ("use" <as/SVOC/A><SVO><SV>V INF)
  ("use" <as/SVOC/A><SVO><SV>V PRES -SG3 VFIN (@+FMAINV)))
("<your>"
  ("you" PRON PERS GEN SG2/PL2 (@GN>)))
("<programs>"
  ("program" <SVO>V PRES SG3 VFIN (@+FMAINV))
  ("program" N NOM PL))
("<most>"
  ("much" ADV SUP)
  ("much" <Quant>PRON SUP SG)
  ("much" <Quant>DET POST SUP SG (@QN>))
  ("many" <Quant>PRON SUP PL)
  ("many" <Quant>DET POST SUP PL (@QN>)))
("<effectively>"
  ("effective" <DER:ive><DER:ly>ADV))
("<$\>")
("<*put>"
  ("put" <*><SVO>PCP2)
  ("put" <*><SVO>V PAST VFIN (@+FMAINV))
  ("put" <*><SVO>V SUBJUNCTIVE VFIN (@+FMAINV) )
  ("put" <*><SVO>V IMP VFIN (@+FMAINV))
  ("put" <*><SVO>V INF)
  ("put" <*><SVO>V PRES -SG3 VFIN (@+FMAINV)))
("<only>"
  ("only" ADV)
```

-continued

```
    ("only" A ABS))
  ("<one>"
    ("one" NUM CARD)
    ("one" PRON NOM SG))
  ("<copy>"
    ("copy" <SVO><SV><Pfor>V SUBJUNCTIVE VFIN (@+FMAINV))
    ("copy" <SVO><SV><Pfor>V IMP VFIN (@+FMAINV))
    ("copy" <SVO><SV><Pfor>V INF)
    ("copy" <SVO><SV><Pfor>V PRES -SG3 VFIN (@+FMAINV))
    ("copy" N NOM SG))
  ("<of>"
    ("of" PREP ))
  ("<each>"
    ("each" <Quant>DET CENTRAL SG (@QN>))
    ("each" <NonMod><Quant>PRON SG))
  ("<program>"
    ("program" <SVO>V SUBJUNCTIVE VFIN (@+FMAINV))
    ("program" <SVO>V IMP VFIN (@+FMAINV))
    ("program" <SVO>V INF)
    ("program" <SVO>V PRES -SG3 VFIN (@+FMAINV))
    ("program" N NOM SG))
  ("<on>"
    ("on" PREP
    ("on" ADV ADVL (@ADVL)))
  ("<your>"
    ("your" PRON PERS GEN SG2/PL2 (@GN>)))
  ("<hard_disk>"
    ("hard_disk" N NOM SG ))
  ("<$,>")
  ("<*having>"
    ("have" <*><SVO><SVOC/A>PCP1))
  ("<more-than>"
    ("more-than" <CompPP>PREP)
    ("more-than" <**CLB>CS (@CS))
    ("more-than" ADV))
  ("<one>"
    ("one" NUM CARD)
    ("one" PRON NOM SG))
  ("<copy>"
    ("copy" <SVO><SV><Pfor>V SUBJUNCTIVE VFIN (@+FMAINV))
    ("copy" <SVO><SV><Pfor>V IMP VFIN (@+FMAINV))
    ("copy" <SVO><SV><Pfor>V INF)
    ("copy" <SVO><SV><Pfor>V PRES -SG3 VFIN (@+FMAINV))
    ("copy" N NOM SG))
  ("<can>"
    ("can" N NOM SG)
    ("can" V AUXMOD VFIN (@+FAUXV)))
  ("<cause>"
    ("cause" N NOM SG)
    ("cause" <SVO><SVOO>V SUBJUNCTIVE VFIN (@+FMAINV))
    ("cause" <SVO><SVOO>V IMP VFIN (@+FMAINV))
    ("cause" <SVO><SVOO>V INF)
    ("cause" <SVO><SVOO>V PRES -SG3 VFIN (@+FMAINV)))
  ("<errors>"
    ("error" N NOM PL))
  ("<$,>")
    ("<*whenever>"
    ("whenever" <*><**CLB>ADV WH (@ADVL)))
  ("<you>"
    ("you" <NonMod>PRON PERS NOM SG2/PL2)
    ("you" <NonMod>PRON PERS ACC SG2/PL2))
  ("<copy>"
    ("copy" <SVO><SV><Pfor>V SUBJUNCTIVE VFIN (@+FMAINV))
    ("copy" <SVO><SV><Pfor>V IMP VFIN (@+FMAINV))
    ("copy" <SVO><SV><Pfor>V INF)
    ("copy" <SVO><SV><Pfor>V PRES -SG3 VFIN (@+FMAINV))
    ("copy" N NOM SG))
  ("<a>"
    ("a" <Indef>DET CENTRAL ART SG (@DN>)))
  ("<program>"
    ("program" <SVO>V SUBJUNCTIVE VFIN (@+FMAINV))
    ("program" <SVO>V IMP VFIN (@+FMAINV))
    ("program" <SVO>V INF)
    ("program" <SVO>V PRES -SG3 VFIN (@+FMAINV))
    ("program" N NOM SG))
  ("<disk>"
    ("disk" <SVO><Rare>V IMP VFIN (@+FMAINV))
    ("disk" <SVO><Rare>V INF)
    ("disk" N NOM SG))
  ("<to>"
```

-continued

```
  ("to" PREP)
  ("to" INFMARK>(@INFMARK>)))
("<your>"
  ("you" PRON PERS GEN SG2/PL2 (@GN>)))
("<hard_disk>"
  ("hard_disk" N NOM SG))
("<$\>")
("<be>"
  ("be" <SV><SVC/N><SVC/A>V SUBJUNCTIVE VFIN)
  ("be" <SV><SVC/N><SVC/A>V INF)
  ("be" <SV><SVC/N><SVC/A>V IMP VFIN (@+FMAINV)))
("<careful>"
  ("careful" A ABS ))
("<not>"
  ("not" NEG-PART (@NEG)))
("<to>"
  ("to" PREP)
  ("to" INFMARK>(@INFMARK>)))
("<copy>"
  ("copy" <SVO><SV><P/ob>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("copy" <SVO><SV><P/ob>V IMP VFIN (@+FMAINV))
  ("copy" <SVO><SV><P/ob>V INF)
  ("copy" <SVO><SV><P/ob>V PRES -SG3 VFIN (@+FMAINV))
  ("copy" N NOM SG))
("<a>"
("a" <Indef>DET CENTRAL ART SG (@DN>)))
("<*system>"
  ("system" <*>N NOM SG))
(<*folder>"
  ("folder" <*><DER:er>N NOM SG))
("<$>")
("<*always>"
  ("always" <*>ADV ADVL (@ADVL)))
("<check>"
  ("check" <SVO><SV><P/for><P/with><P/on>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("check" <SVO><SV><P/for><P/with><P/on>V IMP VFIN (@+FMAINV))
  ("check" <SVO><SV><P/for><P/with><P/on>V INF)
  ("check" <SVO><SV><P/for><P/with><P/on>V PRES -SG3 VFIN (@+FMAINV))
  ("check" N NOM SG))
("<to>"
  ("to" PREP)
  ("to" INFMARK>(@INFMARK>)))
("<see>"
  ("see" <as/SVOC/A><SVO><SV><InfComp>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("see" <as/SVOC/A><SVO><SV><InfComp>V IMP VFIN (@+FMAINV))
  ("see" <as/SVOC/A><SVO><SV><InfComp>V INF)
  ("see" <as/SVOC/A><SVO><SV><InfComp>V PRES -SG3 VFIN (@+FMAINV)))
("<what>"
  ("what" <NonMod><*'CLB>PRON WH SG/PL)
  ("what" <*'CLB>DET PRE WH SG/PL (@DN>)))
("you_>"
  ("you_" <NonMod>PRON PERS NOM SG2/PL2 SUBJ (@SUBJ)))
("<_'ve"
  ("have" <SVO>V PRES -SG3 VFIN))
("<copied>"
  ("copy" <SVO><SV><P/ob>PCP2)
  ("copy" <SVO><SV><P/ob>V PAST VFIN (@+FMAINV)))
("<$\>")
("<and>"
  ("and" CC (@CC)))
("<drag>"
  ("drag" <SVO><SV>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("drag" <SVO><SV>V IMP VFIN (@+FMAINV))
  ("drag" <SVO><SV>V INF)
  ("drag" <SVO><SV>V PRES -SG3 VFIN (@+FMAINV))
  ("drag" N NOM SG))
("<any>"
  ("any" <Quant>DET CENTRAL SG/PL (@QN>))
  ("any" ADV AD-A>(@AD-A>))
  ("any" <NonMod><Quant>PRON SG/PL))
("<extra>"
  ("extra" A ABS))
("<*system>"
  ("system" <*>N NOM SG))
("<*folders>"
  ("folder" <*><DER:er>N NOM PL))
("<to>"
  ("to" PREP)
  ("to" INFMARK>(@INFMARK>)))
("<the>"
```

-continued

```
  ("the" <Def>DET CENTRAL ART SG/PL (@DN>)))
("<*trash>"
  ("trash" <*><SVO>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("trash" <*><SVO>V IMP VFIN (  +FMAINV))
  ("trash" <*><SVO>V INF)
  ("trash" <*><SVO>V PRES -SG3 VFIN (@+FMAINV))
  ("trash" <*><-Indef>N NOM SG ))
("<$.>")
("<*if>"
  ("if" <*><*CLB>CS (@CS)))
("<a>"
  ("a" <Indef>DET CENTRAL ART SG (@DN>)))
("<program>"
  ("program" <SVO>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("program" <SVO>V IMP VFIN (@+FMAINV))
  ("program" <SVO>V INF)
  ("program" <SVO>V PRES -SG3 VFIN (@+FMAINV))
  ("program" N NOM SG))
("<malfunctions>"
  ("malfunction" <SV>V PRES SG3 VFIN (@+FMAINV)))
("<consistently>"
  ("consistent" <DER:ly>ADV))
("<$,>")
("<try>"
  ("try" <SVO><SV><P/for>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("try" <SVO><SV><P/for>V IMP VFIN (@+FMAINV))
  ("try" <SVO><SV><P/for>V INF)
  ("try" <SVO><SV><P/for>V PRES -SG3 VFIN (@+FMAINV))
  ("try" N NOM SG))
("<installing>"
  ("install" <SVO>PCP1))
("<a>"
  ("a" <Indef>DET CENTRAL ART SG (@DN>)))
("<fresh>"
  ("fresh" A ABS ))
("<copy>"
  ("copy" <SVO><SV><P/of>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("copy" <SVO><SV><P/of>V IMP VFIN (@+FMAINV))
  ("copy" <SVO><SV><P/of>V INF)
  ("copy" <SVO><SV><P/of>V PRES -SG3 VFIN (@+FMAINV))
  ("copy" N NOM SG))
("<$.>")
("<*if>"
  ("if" <*><*CLB>CS (@CS)))
("<that>"
  ("that" <**CLB>CS (@CS))
  ("that" DET CENTRAL DEM SG (@DN>))
  ("that" ADV AD-A>(@AD-A>))
  ("that" PRON DEM SG)
  ("that" <NonMod><**CLB><Rel>PRON SG/PL))
("<does>"
  ("do" <SVO><SVOO><SV>V PRES SG3 VFIN))
("<not>"
  ("not" NEG-PART (@NEG)))
("<help>"
  ("help" <SVO><SV><InfComp><P/with>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("help" <SVO><SV><InfComp><P/with>V IMP VFIN (@+FMAINV))
  ("help" <SVO><SV><InfComp><P/with>V INF)
  ("help" <SVO><SV><InfComp><P/with>V PRES -SG3 VFIN (@+FMAINV))
  ("help" N NOM SG))
("<$\>")
("<find>"
  ("find" <SVOO><SVOC/N><SVOC/A><SVO><SV><P/for>V SUBJUNCTIVE VFIN
(@+FMAINV))
  ("find" <SVOO><SVOC/N><SVOC/A><SVO><SV><P/for>V IMP VFIN (@+FMAINV)
  ("find" <SVOO><SVOC/N><SVOC/A><SVO><SV><P/for>V INF)
  ("find" <SVOO><SVOC/N><SVOC/A><SVO><SV><P/for>V PRES -SG3 VFIN
(@+FMAINV))
  ("find" N NOM SG))
("<out>"
  ("out" ADV ADVL (@ADVL)))
("<from>"
  ("from" PREP))
("<the>"
  ("the" <Def>DET CENTRAL ART SG/PL (@DN>)))
("<software>"
  ("software" <-Indef>N NOM SG))
("<manufacturer>"
  ("manufacturer" <DER:er>N NOM SG))
("<whether>"
```

-continued

```
  ("whether" <**CLB>CS (@CS)))
("<your>"
  ("you" PRON PERS GEN SG2/PL2 (@GN>)))
("<version>"
  ("version" N NOM SG))
("<of>"
  ("of" PREP ))
("<the>"
  ("the" <Def>DET CENTRAL ART SG/PL (@DN>)))
("<program>"
  ("program" <SVO>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("program" <SVO>V IMP VFIN (@+FMAINV))
  ("program" <SVO>V INF)
  ("program" <SVO>V PRES -SG3 VFIN (@+FMAINV))
  ("program" N NOM SG))
("<is>"
  ("be" <SV><SVC/N><SVC/A>V PRES SG3 VFIN))
("<compatible>"
  ("compatible" <DER:ble>A ABS))
("<with>"
  ("with" PREP))
("<the>"
  ("the" <Def>DET CENTRAL ART SG/PL (@DN>)))
("<system>"
  ("system" N NOM SG))
("<software>"
  ("software" <-Inde>N NOM SG))
("<you_>"
  ("you_" <NonMod>PRON PERS NOM SG2/PL2 SUBJ (@SUBJ)))
("<_'re>"
  ("be" <SV><SVC/N><SVC/A>V PRES -SG1,3 VFIN))
("<using>"
  ("use" <ta/SVOC/A><SVO><SV>PCP1))
("<put>"
  ("put" <*><SVO>PCP2)
  ("put" <*><SVO>V PAST VFIN (@+FMAINV))
  ("put" <*><SVO>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("put" <*><SVO>V IMP VFIN (@+FMAINV))
  ("put" <*><SVO>V INF)
  ("put" <*><SVO>V PRES -SG3 VFIN (@+FMAINV)))
("<frequently>"
  ("frequent" <DER:ly>ADV))
("<used>"
  ("use" <ta/SVOC/A><SVO><SV>PCP2)
  ("use" <ta/SVOC/A><SVO><SV>V PAST VFIN (@+FMAINV)))
("<programs>"
  ("program" <SVO>V PRES SG3 VFIN (@+FMAINV))
  ("program" N NOM PL))
("<$\(>")
("<or>"
  ("or" CC (@CC)))
("<aliases>"
  ("alias" N NOM PL))
("<for>"
  ("for" PREP)
  ("for" <**CLB>CS (@CS)))
("<those>"
  ("that" DET CENTRAL DEM PL (@DN>))
  ("that" PRON DEM PL))
("<programs>"
  ("program" <SVO>V PRES SG3 VFIN (@+FMAINV))
  ("program" N NOM PL))
("<$\)>")
("<in>"
  ("in" PREP)
  ("in" ADV ADVL (@ADVL)))
("<the>"
  ("the" <Def>DET CENTRAL ART SG/PL (@DN>)))
("<*apple>"
  ("apple" <*>N NOM SG))
("<menu>"
  ("menu" N NOM SG))
("<so>"
  ("so" <**CLB>CS (@CS))
  ("so" ADV))
("<you>"
  ("you" <NonMod>PRON PERS NOM SG2/PL2)
  ("you" <NonMod>PRON PERS ACC SG2/PL2))
("<can>"
  ("can" N NOM SG)
```

-continued

```
  ("can" V AUXMOD VFIN (@+FAUXV)))
("<open>"
  ("open" <SVO><SV>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("open" <SVO><SV>V IMP VFIN (  +FMAINV))
  ("open" <SVO><SV>V INF)
  ("open" <SVO><SV>V PRES -SG3 VFIN (@+FMAINV))
  ("open" A ABS))
("<the>"
  ("the" <Def>DET CENTRAL ART SG/PL (@DN>)))
("<programs>"
  ("program" <SVO>V PRES SG3 VFIN (@+FMAINV))
  ("program" N NOM PL))
("<more>"
  ("much" ADV CMP)
  ("much" <Quant>PRON CMP SG)
  ("much" <Quant>DET POST CMP SG (@QN>))
  ("many" <Quant>PRON CMP PL)
  ("many" <Quant>DET POST CMP PL (@QN>)))
("conveniently>"
  ("convenient" <DER:ly>ADV))
("<$,>")
("<*see>"
  ("see" <>><as/SVOC/A><SVO><SV><InfComp>V SUBJUNCTIVE VFIN (@+FMAINV)
)
  ("see" <>><as/SVOC/A><SVO><SV><InfComp>V IMP VFIN (@+FMAINV))
  ("see" <>><as/SVOC/A><SVO><SV><InfComp>V INF)
  ("see" <>><as/SVOC/A><SVO><SV><InfComp>V PRES -SG3 VFIN (@+FMAINV)))
("<*chapter>"
  ("chapter" <>>N NOM SG))
("<5>"
  ("5" NUM CARD)
  ("5" NUM CARD))
("<$.>")
("<$!>")
("<*adapting>"
  ("adapt" <>><SVO><SV><Pfor>PCP1))
("<*your>"
  ("you" <>>PRON PERS GEN SG2/PL2 (@GN>)))
("<*computer>"
  ("computer" <>><DER:er>N NOM SG))
("<to>"
  ("to" PREP)
  ("to" INFMARK>(@INFMARK>)))
("<*your>"
  ("you" <>>PRON PERS GEN SG2/PL2 (@GN>)))
("<*own>"
  ("own" <>><SVO><SV>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("own" <>><SVO><SV>V IMP VFIN (@+FMAINV))
  ("own" <>><SVO><SV>V INF)
  ("own" <>><SVO><SV>V PRES -SG3 VFIN (@+FMAINV))
  ("own" <>>A ABS))
("<*use>"
  ("use" <>>N NOM SG)
  ("use" <>><as/SVOC/A><SVO><SV>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("use" <>><as/SVOC/A><SVO><SV>V IMP VFIN (@+FMAINV))
  ("use" <>><as/SVOC/A><SVO><SV>V INF)
  ("use" <>><as/SVOC/A><SVO><SV>V PRES -SG3 VFIN (@+FMAINV)))
("<$,>")
("<$!>")
("<*to>"
  ("to" <>>PREP)
  ("to" <>>INFMARK>(@INFMARK>)))
("<open>"
  ("open" <SVO><SV>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("open" <SVO><SV>V IMP VFIN (@+FMAINV))
  ("open" <SVO><SV>V INF)
  ("open" <SVO><SV>V PRES -SG3 VFIN (@+FMAINV))
  ("open" A ABS))
("<a>"
  ("a" <indef>DET CENTRAL ART SG (@DN>)))
("<program>"
  ("program" <SVO>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("program" <SVO>V IMP VFIN (@+FMAINV))
  ("program" <SVO>V INF)
  ("program" <SVO>V PRES -SG3 VFIN (@+FMAINV))
  ("program" N NOM SG))
("<automatically>"
  ("automatical" <DER:ic><DER:al><DER:ly>ADV))
("<each>"
  ("each" <Quant>DET CENTRAL SG (@QN>))
```

-continued

```
  ("each" <NonMod><Quant>PRON SG))
("<time>"
  ("time" N NOM SG)
  ("time" <SVO><Rare>V IMP VFIN (@+FMAINV))
  ("time" <SVO><Rare>V INF)
)
("<you>"
  ("you" <NonMod>PRON PERS NOM SG2/PL2)
  ("you" <NonMod>PRON PERS ACC SG2/PL2))
("<start>"
  ("start" <SV><SVO><P/for>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("start" <SV><SVO><P/for>V IMP VFIN (@+FMAINV))
  ("start" <SV><SVO><P/for>V INF)
  ("start" <SV><SVO><P/for>V PRES -SG3 VFIN (@+FMAINV))
  ("start" N NOM SG))
("<up>"
  ("up" PREP)
  ("up" ADV ADVL (@ADVL)))
("<$\>")
("<you>"
  ("you" <NonMod>PRON PERS NOM SG2/PL2)
  ("you" <NonMod>PRON PERS ACC SG2/PL2))
("<can>"
  ("can" N NOM SG)
  ("can" V AUXMOD VFIN (@+FAUXV)))
("<put>"
  ("put" <SVO>PCP2)
  ("put" <SVO>V PAST VFIN (@+FMAINV))
  ("put" <SVO>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("put" <SVO>V IMP VFIN (@+FMAINV))
  ("put" <SVO>V INF)
  ("put" <SVO>V PRES -SG3 VFIN (@+FMAINV)))
("<the>"
  ("the" <Def>DET CENTRAL ART SG/PL (@DN>)))
("<program>"
  ("program" <SVO>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("program" <SVO>V IMP VFIN (@+FMAINV))
  ("program" <SVO>V INF)
  ("program" <SVO>V PRES -SG3 VFIN (@+FMAINV))
  ("program" N NOM SG))
("<$\>")
("<or>")
  ("or" CC (@CC)))
("<it>"
  ("it" PRON GEN SG3))
("<alias>"
  ("alias" <Rare>V IMP VFIN (@+FMAINV))
  ("alias" <Rare>V INF)
  ("alias" N NOM SG ))
("<$\>")
("<into>"
  ("into" PREP))
("<the>"
  ("the" <Def>DET CENTRAL ART SG/PL (@DN>)))
("<*startup>"
  ("startup"<*>N NOM SG))
("<*items>"
  ("item" <*>N NOM PL))
("<folder>"
  ("folder" <DER:er>N NOM SG))
("<$,>")
("<*see>"
  ("see" <*><as/SVOC/A><SVO><SV><InfComp>V SUBJUNCTIVE VFIN (@+FMAINV)
)
  ("see" <*><as/SVOC/A><SVO><SV><InfComp>V IMP VFIN (@+FMAINV))
  ("see" <*><as/SVOC/A><SVO><SV><InfComp>V INF)
  ("see" <*><as/SVOC/A><SVO><SV><InfComp>V PRES -SG3 VFIN (@+FMAINV)))
("<*chapter>"
  ("chapter" <*>N NOM SG))
("<$>"
  ("5" NUM CARD)
  ("5" NUM CARD))
("<$\.>")
("<$\">")
("<*adapting>"
  ("adapt" <*><SVO><SV><P/for>PCP1))
("<*your>"
  ("you" <*>PRON PERS GEN SG2/PL2 (@GN>)))
("<*computer>"
  ("computer" <*><DER:er>N NOM SG))
```

-continued

```
("<to>"
  ("to" PREP)
  ("to" INFMARK>(  INFMARK>)))
("<*your>"
  ("you" <*>PRON PERS GEN SG2/PL2 (@GN>)))
("<*own>"
  ("own" <*><SVO><SV>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("own" <*><SVO><SV>V IMP VFIN (@+FMAINV))
  ("own" <*><SVO><SV>V INF)
  ("own" <*><SVO><SV>V PRES -SG3 VFIN (@+FMAINV))
  ("own" <*>A ABS))
("<*use>"
  ("use" <*>N NOM SG)
  ("use" <*><as/SVOC/A><SVO><SV>V SUBJUNCTIVE VFIN (@+FMAINV))
  ("use" <*><as/SVOC/A><SVO><SV>V IMP VFIN (@+FMAINV))
  ("use" <*><as/SVOC/A><SVO><SV>V INF)
  ("use" <*><as/SVOC/A><SVO><SV>V PRES -SG3 VFIN (@+FMAINV)))
("<$.>")
```

EXAMPLE C

Each word of text is further analyzed to disambiguate, if appropriate, between the part-of-speech possibilities, and determine the syntactic function of each word, as set forth in the example below, hereinafter referred to as example D (wherein part-of-speech disambiguation analysis is accomplished). Each of the linguistic processes is discussed in turn below.

```
"<*setting>"        "set" <*> <SVOC/A> <SVO> <SVOO> <SV> <P/on> PCP1
"<*up>"             "up" <*> ADV ADVL @ADVL
"<*your>"           "you" <*> PRON PERS GEN SG2/PL2 @GN>
"<*programs>"       "program" <*> N NOM PL
"<$HEAD>"
"<*this>"           "this" <*> DET CENTRAL DEM SG @DN>
"<chapter>"         "chapter" N NOM SG
"<describes>"       "describe" <as/SVOC/A> <SVO> V PRES SG3 VFIN @+FMAINV
"<how>"             "how" <**CLB> ADV WH
"<to>"              "to" INFMARK> @INFMARK>
"<set>"             "set" <SVOC/A> <SVO> <SVOO> <SV> <P/on> V INF
"<up>"              "up" ADV ADVL @ADVL
"<the>"             "the" <Def> DET CENTRAL ART SG/PL @DN>
"<programs>"        "program" N NOM PL
"<that>"            "that" <**CLB> CS @CS          "that" <NonMod> <**CLB> <Rel> PRON SG/PL
"<you>"             "you" <NonMod> PRON PERS NOM SG2/PL2
"<use>"             "use" N NOM SG          "use" <as/SVOC/A> <SVO> <SV> V PRES -SG3 VFIN
@+FMAINV
"<when>"            "when" <**CLB> ADV WH @ADVL
"<you>"             "you" <NonMod> PRON PERS NOM SG2/PL2
"<work>"            "work" <SV> <SVO> <P/in> <P/on> V PRES -SG3 VFIN @+FMAINV
"<with>"            "with" PREP
"<your>"            "you" PRON PERS GEN SG2/PL2 @GN>
"<computer>"        "computer" <DER:er> N NOM SG
"<$,>"
"<*installing>      "install" <*> <SVO> PCP1
"<your>"            "you" PRON PERS GEN SG2/PL2 @GN>
"<application>"     "application" N NOM SG
"<programs>"        "program" N NOM PL
"<$HEAD>"
"<*most>"           "much" <*> <Quant> DET POST SUP SG @QN>"          "many" <*> <Quant>
DET POST SUP PL @QN>
"<application>"     "application" N NOM SG
"<programs>"        "program" N NOM PL
"<come>"            "come" <SVC/A> <SV> <P/for> V PRES -SG3 VFIN @+FMAINV
"<on>"              "on" PREP          "on" ADV ADVL @ADVL
"<floppy_disks>"        "floppy_disk" N NOM PL
"<$,>"
"<and>"             "and" CC @CC
"<you>"             "you" <NonMod> PRON PERS NOM SG2/PL2
"<install>"         "install" <SVO> V PRES -SG3 VFIN @+FMAINV
"<them>"            "they" <NonMod> PRON PERS ACC PL3
"<by>"              "by" PREP
"<copying>"         "copy" <SVO> <SV> <P/of> PCP1
"<them>"            "they" <NonMod> PRON PERS ACC PL3
"<from>"            "from" PREP
"<the>"             "the" <Def> DET CENTRAL ART SG/PL @DN>
"<floppy_disks>"        "floppy_disk" N NOM PL
"<to>"              "to" PREP
"<your>"            "you" PRON PERS GEN SG2/PL2 @GN>
```

-continued

```
"<hard_disk>"       "hard_disk" N NOM SG
"<$.>"
"<*some>"           "some" <*> <Quant> DET CENTRAL SG/PL @QN>
"<programs>"        "program" N NOM PL
"<have>"            "have" <SVO> <SVOC/A> V PRES -SG3 VFIN
"<special>"         "special" A ABS
"<installation>"    "installation" N NOM SG
"<instructions>"    "instruction" N NOM PL
"<$.>"
"<*see>"            "see" <*> <as/SVOC/A> <SVO> <SV> <InfComp> V IMP VFIN @+FMAINV
"<the>"             "the" <Def> DET CENTRAL ART SG/PL @DN>
"<documentation>"       "documentation" <-Indef> N NOM SG
"<that>"            "that" <NonMod> <**CLB> <Rel> PRON SG/PL
"<came>"            "come" <SVC/A> <SV> <P/for> V PAST VFIN @+FMAINV
"<with>"            "with" PREP
"<your>"            "you" PRON PERS GEN SG2/PL2 @GN>
"<programs>"        "program" N NOM PL
"<$.>"
"<*to>"             "to" <*> INFMARK> @INFMARK>
"<use>"             "use" <as/SVOC/A> <SVO> <SV> V INF
"<your>"            "you" PRON PERS GEN SG2/PL2 @GN>
"<programs>"        "program" N NOM PL
"<most>"            "much" ADV SUP          "much" <Quant> PRON SUP SG          "many"
<Quant> PRON SUP PL
"<effectively>"     "effective" <DER:ive> <DER:ly> ADV
"<$.>"
"<put>"             "put" <*> <SVO> PCP2
"<only>"            "only" ADV
"<one>"             "one" NUM CARD
"<copy>"            "copy" N NOM SG
"<of>"              "of" PREP
"<each>"            "each" <Quant> DET CENTRAL SG @QN>
"<program>"         "program" N NOM SG
"<on>"              "on" PREP
"<your>"            "you" PRON PERS GEN SG2/PL2 @GN>
"<hard_disk>"       "hard_disk" N NOM SG
"<$.>"
"<*having>"         "have" <*> <SVO> <SVOC/A> PCP1
"<more=than>"       "more=than" ADV
"<one>"             "one" NUM CARD
"<copy>"            "copy" N NOM SG
"<can>"             "can" V AUXMOD VFIN @+FAUXV
"<cause>"           "cause" <SVO> <SVOO> V INF
"<errors>"          "error" N NOM PL
"<$.>"
"<*whenever>"       "whenever" <*> <**CLB> ADV WH @ADVL
"<you>"             "you" <NonMod> PRON PERS NOM SG2/PL2
"<copy>"            "copy" <SVO> <SV> <P/of> V PRES -SG3 VFIN @+FMAINV
"<a>"               "a" <Indef> DET CENTRAL ART SG @DN>
"<program>"         "program" N NOM SG
"<disk>"            "disk" N NOM SG
"<to>"              "to" PREP
"<your>"            "you" PRON PERS GEN SG2/PL2 @GN>
"<hard_disk>"       "hard_disk" N NOM SG
"<$.>"
"<be>"              "be" <SV> <SVC/N> <SVC/A> V SUBJUNCTIVE VFIN
"<careful>"         "careful" A ABS
"<not>"             "not" NEG-PART @NEG
"<to>"              "to" INFMARK> @INFMARK>
"<copy>"            "copy" <SVO> <SV> <P/of> V INF
"<a>"               "a" <Indef> DET CENTRAL ART SG @DN>
"<*system>"         "system" <*> N NOM SG
"<*folder>"         "folder" <*> <DER:er> N NOM SG
"<$.>"
"<*always>"         "always" <*> ADV ADVL @ADVL
"<check>"           "check" <SVO> <SV> <P/for> <P/with> <P/on> V IMP VFIN @+FMAINV "check"
N NOM SG
"<to>"              "to" INFMARK> @INFMARK>
"<see>"             "see" <as/SVOC/A> <SVO> <SV> <InfComp> V INF
"<what>"            "what" <NonMod> <**CLB> PRON WH SG/PL
"<you_>"            "you_" <NonMod> PRON PERS NOM SG2/PL2 SUBJ @SUBJ
"<_have>"           "have" <SVO> V PRES -SG3 VFIN
"<copied>"          "copy" <SVO> <SV> <P/of> PCP2
"<$.>"
"<and>"             "and" CC @CC
"<drag>"            "drag" <SVO> <SV> V IMP VFIN @+FMAINV "drag" <SVO> <SV> V INF
                    "drag" <SVO> <SV> V PRES -SG3 VFIN @+FMAINV
"<any>"             "any" <Quant> DET CENTRAL SG/PL @QN>
"<extra>"           "extra" A ABS
"<*system>"         "system" <*> N NOM SG
```

-continued

```
"<"folders>"        "folder" <"> <DER:er> N NOM PL
"<to>"              "to" PREP
"<the>"             "the" <Def> DET CENTRAL ART SG/PL    DN>
"<"trash>"          "trash" <"> <-Indef> N NOM SG
"<$.>"
"<"if>"             "if" <"> <"*CLB> CS @CS
"<a>"               "a" <Indef> DET CENTRAL ART SG @DN>
"<program>"         "program" N NOM SG
"<malfunctions>"        "malfunction" <SV> V PRES SG3 VFIN @+FMAINV
"<consistently>"    "consistent" <DER:ly> ADV
"<$,>"
"<try>"             "try" <SVO> <SV> <P/for> V IMP VFIN @+FMAINV          "try" N NOM SG
"<installing>"      "install" <SVO> PCP1
"<a>"               "a" <Indef> DET CENTRAL ART SG @DN>
"<fresh>"           "fresh" A ABS
"<copy>"            "copy" N NOM SG
"<$,>"
"<"if>"             "if" <"> <"*CLB> CS @CS
"<that>"            "that" PRON DEM SG
"<does>"            "do" <SVO> <SVOO> <SV> V PRES SG3 VFIN
"<not>"             "not" NEG-PART @NEG
"<help>"            "help" <SVO> <SV> <InfComp> <P/with> V INF
"<$,>"
"<find>"            "find" <SVOO> <SVOC/N> <SVOC/A> <SVO> <SV> <P/for> V IMP VFIN
@+FMAINV            "find" <SVOO> <SVOC/N> <SVOC/A> <SVO> <SV> <P/for> V INF
"<out>"             "out" ADV ADVL @ADVL
"<from>"            "from" PREP
"<the>"             "the" <Def> DET CENTRAL ART SG/PL @DN>
"<software>"        "software" <-Indef> N NOM SG
"<manufacturer>"        "manufacturer" <DER:er> N NOM SG
"<whether>"         "whether" <"*CLB> CS @CS
"<your>"            "you" PRON PERS GEN SG2/PL2 @GN>
"<version>"         "version" N NOM SG
"<of>"              "of" PREP
"<the>"             "the" <Def> DET CENTRAL ART SG/PL @DN>
"<program>"         "program" N NOM SG
"<is>"              "be" <SV> <SVC/N> <SVC/A> V PRES SG3 VFIN
"<compatible>"      "compatible" <DER:ble> A ABS
"<with>"            "with" PREP
"<the>"             "the" <Def> DET CENTRAL ART SG/PL @DN>
"<system>"          "system" N NOM SG
"<software>"        "software" <-Indef> N NOM SG
"<you_>"            "you_" <NonMod> PRON PERS NOM SG2/PL2 SUBJ @SUBJ
"<_'re>"            "be" <SV> <SVC/N> <SVC/A> V PRES -SG1,3 VFIN
"<using>"           "use" <as/SVOC/A> <SVO> <SV> PCP1
"<$,>"
"<"put>"            "put" <"> <SVO> PCP2 "put" <"> <SVO> V IMP VFIN @+FMAINV
"<frequently>"      "frequent" <DER:ly> ADV
"<used>"            "use" <as/SVOC/A> <SVO> <SV> PCP2
"<programs>"        "program" N NOM PL
"<$(>"
"<or>"              "or" CC @CC
"<aliases>"         "alias" N NOM PL
"<for>"             "for" PREP
"<those>"           "that" DET CENTRAL DEM PL @DN>
"<programs>"        "program" N NOM PL
"<$)>"
"<in>"              "in" PREP
"<the>"             "the" <Def> DET CENTRAL ART SG/PL @DN>
"<"apple>"          "apple" <"> N NOM SG
"<menu>"            "menu" N NOM SG
"<so>"              "so" <"*CLB> CS @CS
"<you>"             "you" <NonMod> PRON PERS NOM SG2/PL2
"<can>"             "can" V AUXMOD VFIN @+FAUXV
"<open>"            "open" <SVO> <SV> V INF
"<the>"             "the" <Def> DET CENTRAL ART SG/PL @DN>
"<programs>"        "program" N NOM PL
"<more>"            "much" ADV CMP
"<conveniently>"        "convenient" <DER:ly> ADV
"<$.>"
"<"see>"            "see" <"> <as/SVOC/A> <SVO> <SV> <InfComp> V IMP VFIN @+FMAINV
"<"chapter>"        "chapter" <"> N NOM SG
"<5>"               "5" NUM CARD
"<$.>"
"<$">"
"<adapting>"        "adapt" <"> <SVO> <SV> <P/for> PCP1
"<"your>"           "you" <"> PRON PERS GEN SG2/PL2 @GN>
"<"computer>"       "computer" <"> <DER:er> N NOM SG
"<to>"              "to" PREP
"<"your>"           "you" <"> PRON PERS GEN SG2/PL2 @GN>
```

-continued

```
"<own>"          "own" <> A ABS
"<use>"          "use" <> N NOM SG
"$.>"
"$">"
"<to>"           "to" <> INFMARK> @INFMARK>
"<open>"         "open" <SVO> <SV> V INF
"<a>"            "a" <Indef> DET CENTRAL ART SG @DN>
"<program>"      "program" N NOM SG
"<automatically>"    "automatical" <DER:ic> <DER:al> <DER:ly> ADV
"<each>"         "each" <Quant> DET CENTRAL SG @QN>
"<time>"         "time" N NOM SG
"<you>"          "you" <NonMod> PRON PERS NOM SG2/PL2
"<start>"        "start" <SV> <SVO> <Proc> V PRES -SG3 VFIN @+FMAINV
"<up>"           "up" ADV ADVL @ADVL
"$,>"
"<you>"          "you" <NonMod> PRON PERS NOM SG2/PL2
"<can>"          "can" V AUXMOD VFIN @+FAUXV
"<put>"          "put" <SVO> V INF
"<the>"          "the" <Def> DET CENTRAL ART SG/PL @DN>
"<program>"      "program" N NOM SG
"$(>"
"<or>"           "or" CC @CC
"<its>"          "it" PRON GEN SG3
"<alias>"        "alias" N NOM SG
"$)>"
"<into>"         "into" PREP
"<the>"          "the" <Def> DET CENTRAL ART SG/PL @DN>
"<*startup>"     "startup" <*> N NOM SG
"<items>"        "item" <> N NOM PL
"<folder>"       "folder" <DER:er> N NOM SG
"$.>"
"<*see>"         "see" <> <ns/SVOC/A> <SVO> <SV> <InfComp> V IMP VFIN @+FMAINV
"<*chapter>"     "chapter" <*> N NOM SG
"<5>"            "5" NUM CARD
"$.>"
"$.>"
"<adapting>"     "adapt" <> <SVO> <SV> <Pfor> PCP1
"<*you>"         "you" <*> PRON PERS GEN SG2/PL2 @GN>
"<*computer>"    "computer" <*> <DER:er> N NOM SG
"<to>"           "to" PREP
"<*you>"         "you" <*> PRON PERS GEN SG2/PL2 @GN>
"<own>"          "own" <> A ABS
"<*use>"         "use" <*> N NOM SG
"$.>"
```

EXAMPLE D

At step **303**, the linguistic analysis begins by morphologically and lexically analyzing each word of the text to determine its possible morphological and lexical features. Morphological analysis involves, among other things, mapping a word to its base form. Morphological analysis takes each word and, either through derivation (e.g., "re-initialize" maps to "initialize") or inflection (e.g., "initializing" maps to "initialize"), reduces it to its base form. For example, with reference to FIG. 4, a lookup in the lexicon of the word "initializing" **403** is performed by lexical analysis and fails. Morphological analysis reduces the word to its base form "initialize" by stripping the "ing" ending and adding "e", as indicated by annotation **402** ("</base "initialize">"). Using this base form of the word, lexical analysis then performs a successful lookup in the lexicon to determine the lexical features of the word. Lexical analysis determines the word is a verb. More specifically, lexical analysis determines the word's part-of-speech is a verb present participle, as indicated by part-of-speech annotation **405** ("</pos PCP1>"); it also determined the word participates in a subject-verb-object construction, as indicated by lexical features annotation **404** ("</lfeats><SVO>>"). Furthermore, the morphological features, e.g., part-of-speech, are determined. Morphological features provide an inference of the linguistic properties of a word (e.g., tense, person, mood) based on how the word is used in a particular context. In the case of the word "initializing" **403**, there are no morphological features as indicated by an empty morphological features annotation **406**. However, morphological features may be inferred from the fact that lexical analysis has identified the word as a present participle (due to the—ing ending) as is indicated by part-of-speech annotation **405**. Finally, it should be noted that since lexical analysis determined "initialize" is a verb in a subject-verb-object construction, it will search for an object following the verb. In this way, syntactic labeling is possible, at least to the extent that an association of the words in a sentence with the syntactic functions they play within the particular context ("@Subject", "@Object") may be determined.

As another example, "use" **407** may be a noun, as indicated by part-of-speech annotation **408** ("</pos N>"), in which case it takes on the morphological features of NOM (nominal) and SG (singular, as opposed to plural in the case of "uses"), as indicated by morphological features annotation **409** ("</mfeats NOM SG>"). However, "use" **407** may also be a verb, as indicated by part-of-speech annotation **410** ("</pos V>"), in which case it has the morphological features of an imperative (IMP), i.e., "you use", and a finite verb (VFIN), as indicated by morphological features annotation **411** ("</mfeats IMP VFIN>"). "[U]se" may also be used as a normal present tense, non third person singular finite verb, i.e., "they use", as indicated by morphological features annotation **412** ("</mfeats PRES-SG3 VFIN>"). Thus, "use" **407** has three possible uses: it may be a noun or either of two verb readings.

As will be seen, it is important to identify the correct use of each word in order to perform knowledge mining. For example, knowledge mining attempts to identify technical terms t be included in the domain catalog by searching for particular syntactic patterns representative of technical terms, e.g., a noun phrase. If it sees that "disk", "repair" and "program" in phrase **401** are nouns, then it recognizes the three nouns as constituting a noun phrase, and thus, potentially a technical term. However, "repair" and "program" can also be verbs, so lexical analysis must first determine that the words are, in this context, nouns. Notice, however, with reference to FIG. 4, that "repair" has a noun analysis, as indicated by part-of-speech annotation **413** ("</pos N>"). "[P]rogram" has a verb and a noun analysis, as indicated by part-of-speech annotations **414** and **415**, respectively. What has happened here already is a certain amount of part-of-speech disambiguation analysis, i.e., the lexical and morphological analyses have together determined on the basis of local constraints and knowledge about how combinations of words are formed, the proper part-of-speech for certain terms. Using phrase **401** as an example, the analysis, at a certain level of abstraction, proceeds as follows: the first occurrence of "disk" is unambiguously a noun; "program", however, can be a noun or a verb, but because it precedes a preposition ("for") and follows a verb sequence ("use" "commercial"), it is very likely a noun; if "disk" is a noun and "program" is a noun, then "repair" is most likely a noun as well.

The linguistic analysis performed at step **303** does not generate a complete syntactic analysis of the sentence, but it is able to, in some instances, identify components of sentence structure, e.g., subject, verb, and object. In this way, extraction of semantically important terms and conceptually interesting data from the document is possible on the basis of their syntactic identity without requiring full syntactic analysis.

The lexical, morphological, part-of-speech disambiguation and syntactic label processing performed in the linguistic analysis stage are not concurrent processes, nor do they function sequentially with respect to each other. Lexical analysis and morphological analysis are performed essentially in parallel. Part-of-speech disambiguation is coupled closely to morphological analysis. Determination of syntactic functions and syntactic labeling follows closely behind part-of-speech disambiguation.

Part-of-speech disambiguation decides between two or more possible analyses of a word. For example, with reference to example C, as a result of lexical and morphological analysis, the word "up" in the sentence "this chapter describes how to set up the programs that you use when you work with your computer" is determined to be either a preposition (PREP) or an adverb (ADV ADVL). A syntactic label of adverbial (@ADVL) is affixed to the latter possibility. Given the context of the sentence in which the word appears, part-of-speech disambiguation analysis is able to determine "up" functions as an adverbial. Thus, as set forth in example D, the part-of-speech which "up" functions as is unambiguously that of an adverb.

Thus, while lexical and morphological analysis generally operate at the word level, part-of-speech disambiguation analysis is concerned with a phrase or sentence, and reduces, to the extent possible, each word of the phrase or sentence to a single, and therefore, unambiguous analysis. Part-of-speech disambiguation analysis looks at a string of words, and on the basis of certain knowledge about the construction of some of those words (namely, that knowledge acquired through lexical and morphological analysis), and the order in which they occur in the sentence, infers likely construction of other words in the sentence. For example, given the sequence of three words "disk repair program" found in phrase **401**, once it has been determined that "disk" is a noun and that "program" is a noun, part-of-speech disambiguation analysis recognizes "repair" must also be a noun. Once part-of-speech disambiguation is completed, syntactic analysis determines and labels each word of text with an appropriate syntactic function.

In an embodiment of the present invention, implementation of the foregoing linguistic analyses and annotations, including lexical and morphological analysis, part-of-speech disambiguation analysis and syntactic labeling, may be accomplished by way of commercially available application software from, for example, LingSoft, Incorporated, of Helsinki, Finland.

As can be seen with reference to example D, each record of linguistically analyzed, annotated and disambiguated text, i.e., each word of the text and its associated linguistic annotations, comprise an arbitrary number of tokens. In some cases, a certain annotation may be missing altogether, e.g., morphological features may not be discerned or present for a particular word. Furthermore, any one field of the record may further comprise an arbitrary number of tokens, e.g., it is not uncommon for lexical analysis to generate an annotation comprising anywhere from zero to five tokens. Thus, at step **304**, the linguistically analyzed, annotated and disambiguated text, as well as the annotations themselves, are explicitly labeled to indicate which tokens refer to which annotations, thereby facilitating subsequent mining. Referring to the example below, hereinafter referred to as example E, the annotations to which the tokens belong is more readily discernible than in the case of example D.

Setting </base "set"> </lfeats <*> <SVOC/A> <SVO> <SVOO> <SV> <Pfon>> </pos PCP1>
</mfeats > </syn @NPHR @-FMAINV>
Up </base "up"> </lfeats <*>> </pos ADV> </mfeats ADVL> </syn @ADVL>
Your </base "you"> </lfeats <*>> </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>>
Programs </base "program"> </lfeats <*>> </pos N> </mfeats NOM PL> </syn @NPHR @OBJ>
HEAD
This </base "this"> </lfeats <*>> </pos DET> </mfeats CENTRAL DEM SG> </syn @DN>>
chapter </base "chapter"> </lfeats > </pos N> </mfeats NOM SG> </syn @SUBJ>
describes </base "describe"> </lfeats <as/SVOC/A> <SVO>> </pos V> </mfeats PRES SG3
VFIN> </syn @+FMAINV>
how </base "how"> </lfeats <**CLB>> </pos ADV> </mfeats WH> </syn @ADVL>
to </base "to"> </lfeats > </pos INFMARK>> </mfeats > </syn @INFMARK>>
set </base "set"> </lfeats <SVOC/A> <SVO> <SVOO> <SV> <Pfon>> </pos V> </mfeats INF>
</syn @-FMAINV>
up </base "up"> </lfeats > </pos ADV> </mfeats ADVL> </syn ADVL>
the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>>

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```
programs </base "program"> </lfeats > </pos N> </mfeats NOM PL> </syn @OBJ @I-OBJ>
that </base "that"> </lfeats <**CLB>> </pos CS> </mfeats> </syn @CS> </base "that"> </lfeats
<NonMod> <**CLB> <Rel>> </pos PRON> </mfeats SG/PL> </syn    SUBJ @OBJ @I-OBJ
@PCOMPL-O>
you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2> </syn
  SUBJ>
use </base "use"> </lfeats > </pos N> </mfeats NOM SG> </syn @OBJ> </base "use"> </lfeats
<as/SVOC/A> <SVO> <SV>> </pos V> </mfeats PRES -SG3 VFIN> </syn @+FMAINV>
when </base "when"> </lfeats <**CLB>> </pos ADV> </mfeats WH> </syn @ADVL>
you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2> </syn
  SUBJ>
work </base "work"> </lfeats <SV> <SVO> <P/in> <P/on>> </pos V> </mfeats PRES -SG3 VFIN>
</syn @+FMAINV>
with </base "with"> </lfeats > </pos PREP> </mfeats> </syn @ADVL>
your </base "you"> </lfeats > </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>>
computer </base "computer"> </lfeats <DER:er>> </pos N> </mfeats NOM SG> </syn @<P>

.
installing </base "install"> </lfeats <*> <SVO>> </pos PCP1> </mfeats> </syn @NPHR @-
FMAINV>
your </base "you"> </lfeats > </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>>
application </base "application"> </lfeats > </pos N> </mfeats NOM SG> </syn @NPHR @NN>>
programs </base "program"> </lfeats > </pos N> </mfeats NOM PL> </syn @NPHR @OBJ>
HEAD
Most </base "much"> </lfeats <*> <Quant>> </pos DET> </mfeats POST SUP SG> </syn
@QN>> </base "many"> </lfeats <*> <Quant>> </pos DET> </mfeats POST SUP PL> </syn
@QN>>
application </base "application"> </lfeats > </pos N> </mfeats NOM SG> </syn @NN>>
programs </base "program"> </lfeats > </pos N> </mfeats NOM PL> </syn @SUBJ>
come </base "come"> </lfeats <SVC/A> <SV> <P/for>> </pos V> </mfeats PRES -SG3 VFIN>
</syn    +FMAINV>
on </base "on"> </lfeats > </pos PREP> </mfeats > </syn @ADVL> </base "on"> </lfeats > </pos
ADV> </mfeats ADVL> </syn @ADVL>
floppy_disks </base "floppy_disk"> </lfeats > </pos N> </mfeats NOM PL> </syn @<P>

.
and </base "and"> </lfeats > </pos CC> </mfeats> </syn @CC>
you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2> </syn
@SUBJ>
install </base "install"> </lfeats <SVO>> </pos V> </mfeats PRES -SG3 VFIN> </syn
  +FMAINV>
them </base "they"> </lfeats <NonMod>> </pos PRON> </mfeats PERS ACC PL3> </syn
@OBJ>
by </base "by"> </lfeats > </pos PREP> </mfeats> </syn @ADVL>
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FMAINV>
them </base "they"> </lfeats <NonMod>> </pos PRON> </mfeats PERS ACC PL3> </syn
@OBJ>
from </base "from"> </lfeats > </pos PREP> </mfeats> </syn @ADVL>
the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>>
floppy_disks </base "floppy_disk"> </lfeats > </pos N> </mfeats NOM PL> </syn @<P>
to </base "to"> </lfeats > </pos PREP> </mfeats > </syn @<NOM @ADVL>
your </base "you"> </lfeats > </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>>
hard_disk </base "hard_disk"> </lfeats > </pos N> </mfeats NOM SG> </syn @<P>

.
Some </base "some"> </lfeats <*> <Quant>> </pos DET> </mfeats CENTRAL SG/PL> </syn
@QN>>
programs </base "program"> </lfeats > </pos N> </mfeats NOM PL> </syn @SUBJ>
have </base "have"> </lfeats <SVO> <SVOC/A>> </pos V> </mfeats PRES -SG3 VFIN> </syn
@+FMAINV>
special </base "special"> </lfeats > </pos A> </mfeats ABS> </syn @AN>>
installation </base "installation"> </lfeats > </pos N> </mfeats NOM SG> </syn @OBJ @NN>>
instructions </base "instruction"> </lfeats > </pos N> </mfeats NOM PL> </syn @OBJ>

.
See </base "see"> </lfeats <*> <as/SVOC/A> <SVO> <SV> <InfComp>> </pos V> </mfeats IMP
VFIN> </syn @+FMAINV>
the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>>
documentation </base "documentation"> </lfeats <-Indef>> </pos N> </mfeats NOM SG> </syn
@OBJ>
that </base "that"> </lfeats <NonMod> <**CLB> <Rel>> </pos PRON> </mfeats SG/PL> </syn
@SUBJ>
came </base "come"> </lfeats <SVC/A> <SV> <P/for>> </pos V> </mfeats PAST VFIN> </syn
@+FMAINV>
with </base "with"> </lfeats > </pos PREP> </mfeats > </syn @ADVL>
your </base "you"> </lfeats > </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>>
programs </base "program"> </lfeats > </pos N> </mfeats NOM PL> </syn @<P>

.
To </base "to"> </lfeats <*>> </pos INFMARK>> </mfeats > </syn @INFMARK>>
use </base "use"> </lfeats <as/SVOC/A> <SVO> <SV>> </pos V> </mfeats INF> </syn @-
FMAINV>
your </base "you"> </lfeats > </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>>
programs </base "program"> </lfeats> </pos N> </mfeats NOM PL> </syn @OBJ>
```

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most </base "much"> </lfeats > </pos ADV> </mfeats SUP> </syn @ADVL @AD-A>> </base "much"> </lfeats <QuanD>> </pos PRON> </mfeats SUP SG> </syn @OBJ PCOMPL-O> </base "many"> </lfeats <QuanD>> </pos PRON> </mfeats SUP PL> </syn @OBJ PCOMPL-O>
effectively </base "effective"> </lfeats <DER:ive> <DER:ly>> </pos ADV> </mfeats > </syn ADVL>

.

Put </base "put"> </lfeats <*> <SVO>> </pos PCP2> </mfeats > </syn @NPHR @PCOMPL-O>
only </base "only"> </lfeats > </pos ADV> </mfeats > </syn @AD-A>>
one </base "one"> </lfeats > </pos NUM> </mfeats CARD> </syn @QN>>
copy </base "copy"> </lfeats > </pos N> </mfeats NOM SG> </syn @NPHR @OBJ>
of </base "of"> </lfeats > </pos PREP> </mfeats > </syn @<NOM-OF>
each </base "each"> </lfeats <QuanD>> </pos DET> </mfeats CENTRAL SG> </syn @QN>>
program </base "program"> </lfeats > </pos N> </mfeats NOM SG> </syn @<P>
on </base "on"> </lfeats > </pos PREP> </mfeats > </syn @<NOM @ADVL>
your </base "you"> </lfeats > </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>>
hard_disk </base "hard_disk"> </lfeats > </pos N> </mfeats NOM SG> </syn @<P>

.

Having </base "have"> </lfeats <*> <SVO> <SVOC/A>> </pos PCP1> </mfeats > </syn @-FMAINV>
more-than </base "more-than"> </lfeats > </pos ADV> </mfeats > </syn @ADVL @AD-A>>
one </base "one"> </lfeats > </pos NUM> </mfeats CARD> </syn @QN>>
copy </base "copy"> </lfeats > </pos N> </mfeats NOM SG> </syn @SUBJ>
can </base "can"> </lfeats > </pos V> </mfeats AUXMOD VFIN> </syn @+FAUXV>
cause </base "cause"> </lfeats <SVO> <SVOO>> </pos V> </mfeats INF> </syn @-FMAINV>
errors </base "error"> </lfeats > </pos N> </mfeats NOM PL> </syn @OBJ>

.

Whenever </base "whenever"> </lfeats <*> <**CLB>> </pos ADV> </mfeats WH> </syn @ADVL>
you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2> </syn SUBJ>
copy </base "copy"> </lfeats <SVO> <SV> <P/of>> </pos V> </mfeats PRES -SG3 VFIN> </syn @+FMAINV>
a </base "a"> </lfeats <Indef>> </pos DET> </mfeats CENTRAL ART SG> </syn @DN>>
program </base "program"> </lfeats > </pos N> </mfeats NOM SG> </syn @NN>>
disk </base "disk"> </lfeats > </pos N> </mfeats NOM SG> </syn @OBJ>
to </base "to"> </lfeats > </pos PREP> </mfeats> </syn @<NOM @ADVL>
your </base "you"> </lfeats > </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>>
hard_disk </base "hard disk"> </lfeats > </pos N> </mfeats NOM SG> </syn @<P>

.

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not </base "not"> </lfeats > </pos NEG-PART> </mfeats> </syn @NEG>
to </base "to"> </lfeats > </pos INFMARK>> </mfeats > </syn @INFMARK>>
copy </base "copy"> </lfeats <SVO> <SV> <P/of>> </pos V> </mfeats INF> </syn @-FMAINV>
a </base "a"> </lfeats <Indef>> </pos DET> </mfeats CENTRAL ART SG> </syn @DN>>
System </base "system"> </lfeats <*>> </pos N> </mfeats NOM SG> </syn @NN>>
Folder </base "folder"> </lfeats <*> <DER:er>> </pos N> </mfeats NOM SG> </syn @OBJ>

.

Always </base "always"> </lfeats <*>> </pos ADV> </mfeats ADVL> </syn @ADVL>
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to </base "to"> </lfeats > </pos INFMARK>> </mfeats > </syn @INFMARK>>
see </base "see"> </lfeats <as/SVOC/A> <SVO> <SV> <that/Comp>> </pos V> </mfeats INF> </syn @-FMAINV @<NOM-FMAINV>
what </base "what"> </lfeats <NonMod> <**CLB>> </pos PRON> </mfeats WH SG/PL> </syn @SUBJ @OBJ>
you </base "you_"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2 SUBJ> </syn @SUBJ>
've </base "have"> </lfeats <SVO>> </pos V> <mfeats PRES -SG3 VFIN> </syn @+FAUXV>
copied </base "copy"> </lfeats <SVO> <SV> <P/of>> </pos PCP2> </mfeats > </syn @-FMAINV>

.

and </base "and"> </lfeats > </pos CC> </mfeats > </syn @CC>
drag </base "drag"> </lfeats <SVO> <SV>> </pos V> </mfeats IMP VFIN> </syn @+FMAINV>
</base "drag"> </lfeats <SVO> <SV>> </pos V> </mfeats INF> </syn @-FMAINV> </base "drag">
</lfeats <SVO> <SV>> </pos V> </mfeats PRES -SG3 VFIN> </syn @+FMAINV>
any </base "any"> </lfeats <Quant>> </pos DET> </mfeats CENTRAL SG/PL> </syn @QN>>
extra </base "extra"> </lfeats > </pos A> </mfeats ABS> </syn @AN>>
System </base "system"> </lfeats <*>> </pos N> </mfeats NOM SG> </syn @OBJ @APP NN>>
Folders </base "folder"> </lfeats <*> <DER:er>> </pos N> </mfeats NOM PL> </syn @SUBJ @OBJ @APP>
to </base "to"> </lfeats > </pos PREP> </mfeats> </syn @<NOM @ADVL>
the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>>
Trash </base "trash"> </lfeats <*> <-Indef>> </pos N> </mfeats NOM SG> </syn @<P>

.

If </base "if"> </lfeats <*> <**CLB>> </pos CS> </mfeats> </syn @CS>

-continued

a </base "a"> </lfeats <Indef>> </pos DET> </mfeats CENTRAL ART SG> </syn DN>>
program </base "program"> </lfeats > </pos N> </mfeats NOM SG> </syn SUBJ>
malfunctions </base "malfunction"> </lfeats <SV>> </pos V> </mfeats PRES SG3 VFIN> </syn
@+FMAINV>
consistently </base "consistent"> </lfeats <DER:ly>> </pos ADV> </mfeats> </syn @ADVL>
.
try </base "try"> </lfeats <SVO> <SV> <Pfor>> </pos V> </mfeats IMP VFIN> </syn
@+FMAINV> </base "try"> </lfeats > </pos N> </mfeats NOM SG> </syn @APP @NN>>
installing </base "install"> </lfeats <SVO>> </pos PCP1> </mfeats > </syn @OBJ @APP
@<NOM-FMAINV @-FMAINV>
a </base "a"> </lfeats <Indef>> </pos DET> </mfeats CENTRAL ART SG> </syn @DN>>
fresh </base "fresh"> </lfeats> </pos A> </mfeats ABS> </syn @AN>>
copy </base "copy"> </lfeats > </pos N> </mfeats NOM SG> </syn @OBJ>
.
If </base "if"> </lfeats <*> <**CLB>> </pos CS> </mfeats > </syn @CS>
that </base "that"> </lfeats > </pos PRON> </mfeats DEM SG> </syn @SUBJ>
does </base "do"> </lfeats <SVO> <SVOO> <SV>> </pos V> </mfeats PRES SG3 VFIN> </syn
@+FAUXV>
not </base "not"> </lfeats > </pos NEG-PART> </mfeats > </syn @NEG>
help </base "help"> </lfeats <SVO> <SV> <InfComp> <Pwith>> </pos V> </mfeats INF> </syn
@-FMAINV>
.
find </base "find"> </lfeats <SVOO> <SVOC/N> <SVOC/A> <SVO> <SV> <Pfor>> </pos V>
</mfeats IMP VFIN> </syn @+FMAINV> </base "find"> </lfeats <SVOO> <SVOC/N> <SVOC/A>
<SVO> <SV> <Pfor>> </pos V> </mfeats INF> </syn @-FMAINV>
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from </base "from"> </lfeats > </pos PREP> </mfeats > </syn @ADVL>
the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>>
software </base "software"> </lfeats <-Indef>> </pos N> </mfeats NOM SG> </syn @NN>>
manufacturer </base "manufacturer"> </lfeats <DER:er>> </pos N> </mfeats NOM SG> </syn
@<P>
whether </base "whether"> </lfeats <**CLB>> </pos CS> </mfeats > </syn @CS>
your </base "you"> </lfeats> </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>>
version </base "version"> </lfeats > </pos N> </mfeats NOM SG> </syn @SUBJ>
of </base "of"> </lfeats > </pos PREP> </mfeats > </syn @<NOM-OF>
the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>>
program </base "program"> </lfeats > </pos N> </mfeats NOM SG> </syn @<P>
is </base "be"> </lfeats <SV> <SVC/N> <SVC/A>> </pos V> </mfeats PRES SG3 VFIN> </syn
@+FMAINV>
compatible </base "compatible"> </lfeats <DER:ble>> </pos A> </mfeats ABS> </syn
@PCOMPL-S>
with </base "with"> </lfeats > </pos PREP> </mfeats > </syn @<NOM @ADVL>
the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>>
system </base "system"> </lfeats > </pos N> </mfeats NOM SG> </syn @NN>>
software </base "software"> </lfeats <-Indef>> </pos N> </mfeats NOM SG> </syn @<P>
you </base "you_"> </lfeats <NonMod>> </pos PRON> </mfeats PER NOM SG2/PL2 SUBJ>
</syn @SUBJ>
're </base "be"> </lfeats <SV> <SVC/N> <SVC/A>> </pos V> </mfeats PRES-SG1,3 VFIN>
</syn @+FMAINV @+FAUXV>
using </base "use"> </lfeats <as/SVOC/A> <SVO> <SV>> </pos PCP1> </mfeats > </syn @-
FMAINV>
.
Put </base "put"> </lfeats <*> <SVO>> </pos PCP2> </mfeats > </syn @<P-FMAINV> </base
"put"> </lfeats <*> <SVO>> </pos V> </mfeats IMP VFIN> </syn @+FMAINV>
frequently </base "frequent"> </lfeats <DER:ly>> </pos ADV> </mfeats > </syn @ADVL @AD-
A>>
used </base "use"> </lfeats <as/SVOC/A> <SVO> <SV>> </pos PCP2> </mfeats > </syn @AN>>
programs </base "program"> </lfeats > </pos N> </mfeats NOM PL> </syn @SUBJ @OBJ>
(
or </base "or"> </lfeats > </pos CC> </mfeats > </syn @CC>
aliases </base "alias"> </lfeats > </pos N> </mfeats NOM PL> </syn @SUBJ @OBJ @APP>
for </base "for"> </lfeats > </pos PREP> </mfeats > </syn @<NOM @ADVL>
those </base "that"> </lfeats > </pos DET> </mfeats CENTRAL DEM PL> </syn @DN>>
programs </base "program"> </lfeats > </pos N> </mfeats NOM PL> </syn @<P>
)
in </base "in"> </lfeats > </pos PREP> </mfeats > </syn @ADVL>
the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>>
Apple </base "apple"> </lfeats <*>> </pos N> </mfeats NOM SG> </syn @NN>>
menu </base "menu"> </lfeats > </pos N> </mfeats NOM SG> </syn @<P>
so </base "so"> </lfeats <**CLB>> </pos CS> </mfeats > </syn @CS>
you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2> </syn
@SUBJ>
can </base "can"> </lfeats > </pos V> </mfeats AUXMOD VFIN> </syn @+FAUXV>
open </base "open"> </lfeats <SVO> <SV>> </pos V> </mfeats INF> </syn @-FMAINV>
the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>>
programs </base "program"> </lfeats > </pos N> </mfeats NOM PL> </syn @OBJ>
more </base "much"> </lfeats > </pos ADV> </mfeats CMP> </syn @ADVL @AD-A>>
conveniently </base "convenient"> </lfeats <DER:ly>> </pos ADV> </mfeats > </syn @ADVL>
.
See </base "see"> </lfeats <*> <as/SVOC/A> <SVO> <SV> <InfComp>> </pos V> </mfeats IMP

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```
VFIN> </syn   +FMAINV>
Chapter </base "chapter"> </lfeats <*>> </pos N> </mfeats NOM SG> </syn   OBJ   NN>>
5 </base "5"> </lfeats > </pos NUM> </mfeats CARD> </syn @OBJ   PCOMPL-O   QN>
@<NOM @ADVL>
.
-
Adapting </base "adapt"> </lfeats <*> <SVO> <SV> <Pfoc>> </pos PCP1> </mfeats > </syn
@OBJ @PCOMPL-S @PCOMPL-O @APP @-FMAINV @AN>>
Your </base "you"> </lfeats <*>> </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>>
Computer </base "computer"> </lfeats <*> <DER:er>> </pos N> </mfeats NOM SG> </syn
@OBJ>
to </base "to"> </lfeats > </pos PREP> </mfeats > </syn @<NOM @ADVL>
Your </base "you"> </lfeats <*>> </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>>
Own </base "own"> </lfeats <*>> </pos A> </mfeats ABS> </syn @AN>>
Use </base "use"> </lfeats <*>> </pos N> </mfeats NOM SG> </syn @<P>
.
-
To </base "to"> </lfeats <*>> </pos INFMARK>> </mfeats > </syn @INFMARK>>
open </base "open"> </lfeats <SVO> <SV>> </pos V> </mfeats INF> </syn @-FMAINV>
a </base "a"> </lfeats <Indef>> </pos DET> </mfeats CENTRAL ART SG> </syn @DN>>
program </base "program"> </lfeats > </pos N> </mfeats NOM SG> </syn @OBJ>
automatically </base "automatical"> </lfeats <DER:ic> <DER:al> <DER:ly>> </pos ADV> </mfeats
> </syn @ADVL @AD-A>>
each </base "each"> </lfeats <Quant>> </pos DET> </mfeats CENTRAL SG> </syn @QN>>
time </base "time"> </lfeats > </pos N> </mfeats NOM SG> </syn @OBJ @ADVL>
you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2> </syn
  SUBJ>
start </base "start"> </lfeats <SV> <SVO> <Pfoc>> </pos V> </mfeats PRES -SG3 VFIN> </syn
@+FMAINV>
up </base "up"> </lfeats > </pos ADV> </mfeats ADVL> </syn @ADVL>
,
you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2> </syn
@SUBJ>
can </base "can"> </lfeats > </pos V> </mfeats AUXMOD VFIN> </syn @+FAUXV>
put </base "put"> </lfeats <SVO>> </pos V> </mfeats INF> </syn @-FMAINV>
the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>>
program </base "program"> </lfeats > </pos N> </mfeats NOM SG> </syn @OBJ>
(
or </base "or"> </lfeats > </pos CC> </mfeats> </syn @CC>
its </base "it"> </lfeats > </pos PRON> </mfeats GEN SG3> </syn @GN>>
alias </base "alias"> </lfeats > </pos N> </mfeats NOM SG> </syn @SUBJ @OBJ>
)
into </base "into"> </lfeats > </pos PREP> </mfeats > </syn @ADVL>
the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>>
Startup </base "startup"> </lfeats <*>> </pos N> </mfeats NOM SG> </syn @NN>>
Items </base "item"> </lfeats <*>> </pos N> </mfeats NOM PL> </syn @NN>>
folder </base "folder"> </lfeats <DER:er>> </pos N> </mfeats NOM SG> </syn @<P>
.
Soc </base "soc"> </lfeats <*> <as/SVOC/A> <SVO> <SV> <InfComp>> </pos V> </mfeats IMP
VFIN> </syn @+FMAINV>
Chapter </base "chapter"> </lfeats <*>> </pos N> </mfeats NOM SG> </syn @OBJ @NN>>
5 </base "5"> </lfeats > </pos NUM> </mfeats CARD> </syn @OBJ @PCOMPL-O @QN>
@<NOM @ADVL>
.
-
Adapting </base "adapt"> </lfeats <*> <SVO> <SV> <Pfoc>> </pos PCP1> </mfeats > </syn
@OBJ @PCOMPL-S @PCOMPL-O @APP @-FMAINV @AN>>
Your </base "you"> </lfeats <*>> </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>>
Computer </base "computer"> </lfeats <*> <DER:er>> </pos N> </mfeats NOM SG> </syn
@OBJ>
to </base "to"> </lfeats > </pos PREP> </mfeats > </syn @<NOM @ADVL>
Your </base "you"> </lfeats <*>> </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>>
Own </base "own"> </lfeats <*>> </pos A> </mfeats ABS> </syn @AN>>
Use </base "use"> </lfeats <*>> </pos N> </mfeats NOM SG> </syn @<P>
.
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EXAMPLE E

Referring to FIG. 4 or example E, in an embodiment of the present invention the labels take the form of "</keyword>", where keyword may be one of "base", "lfeats", "pos", "mfeats", or "syn", specifying that the token(s) which follow the keyword comprise, respectively, the base form, lexical features, part-of-speech tag, morphological features, and syntactic label associated with each word.

Referring to the below example, hereinafter referred to as example F, at step 305, markup tags that were stripped at step 302 (e.g., from the text in example A) are merged with the linguistically annotated and explicitly labeled text (e.g., of example E) yielding a stream of tokens, some of which are words of text from the document, some of which are linguistic annotations about a word of text, and some of which are markup tags associated with a string of tokens representing a phrase or sentence from the document.

<chapter> Setting </base "set"> </lfeats <*> <SVOC/A> <SVO> <SVOO> <SV> <Pfon>> </pos PCP1> </mfeats > </syn NPHR @-FMAINV> Up </base "up"> </lfeats <*>> </pos ADV> </mfeats ADVL> </syn @ADVL> Your </base "you"> </lfeats <*>> </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>> Programs </base "program"> </lfeats <*>> </pos N> </mfeats NOM PL> </syn @NPHR @OBJ> </echapter>
</para>
This </base "this"> </lfeats <*>> </pos DET> </mfeats CENTRAL DEM SG> </syn @DN>> chapter </base "chapter"> </lfeats > </pos N> </mfeats NOM SG> </syn @SUBJ> describes </base "describe"> </lfeats <as/SVOC/A> <SVO>> </pos V> </mfeats PRES SG3 VFIN> </syn @+FMAINV> how </base "how"> </lfeats <**CLB>> </pos ADV> </mfeats WH> </syn @ADVL> to </base "to"> </lfeats > </pos INFMARK>> </mfeats > </syn @INFMARK>> set </base "set"> </lfeats <SVOC/A> <SVO> <SVOO> <SV> <Pfon>> </pos V> </mfeats INF> </syn @-FMAINV> up </base "up"> </lfeats> </pos ADV> </mfeats ADVL> </syn @ADVL> the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>> programs </base "program"> </lfeats > </pos N> </mfeats NOM PL> </syn @OBJ @I-OBJ> that </base "that"> </lfeats <**CLB>> </pos CS> </mfeats > </syn @CS> </base "that"> </lfeats <NonMod> <**CLB> <Rel>> </pos PRON> </mfeats SG/PL> </syn @SUBJ @OBJ @I-OBJ @PCOMPL-O> you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2> </syn @SUBJ> use </base "use"> </lfeats > </pos N> </mfeats NOM SG> </syn @OBJ> </base "use"> </lfeats <as/SVOC/A> <SVO> <SV>> </pos V> </mfeats PRES -SG3 VFIN> </syn @+FMAINV> when </base "when"> </lfeats <**CLB>> </pos ADV> </mfeats WH> </syn @ADVL> you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2> </syn @SUBJ> work </base "work"> </lfeats <SV> <SVO> <Pfin> <Pfon>> </pos V> </mfeats PRES -SG3 VFIN> </syn @+FMAINV> with </base "with"> </lfeats > </pos PREP> </mfeats > </syn @ADVL> your </base "you"> </lfeats> </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>> computer </base "computer"> </lfeats <DER:er>> </pos N> </mfeats NOM SG> </syn @<P>.
</epara>
</section>
Installing </base "install"> </lfeats <*> <SVO>> </pos PCP1> </mfeats > </syn @NPHR @-FMAINV> your </base "you"> </lfeats > </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>> application </base "application"> </lfeats > </pos N> </mfeats NOM SG> </syn @NPHR @NN>> programs </base "program"> </lfeats > </pos N> </mfeats NOM PL> </syn @NPHR @OBJ>
</section>
</para>
Most </base "much"> </lfeats <*> <Quant>> </pos DET> </mfeats posT SUP SG> </syn @QN>> </base "many"> </lfeats <*> <Quant>> </pos DET> </mfeats posT SUP PL> </syn @QN>> application </base "application"> </lfeats > </pos N> </mfeats NOM SG> </syn @NN>> programs </base "program"> </lfeats > </pos N> </mfeats NOM PL> </syn @SUBJ> come </base "come"> </lfeats <SVC/A> <SV> <Pfor>> </pos V> </mfeats PRES -SG3 VFIN> </syn @+FMAINV> on </base "on"> </lfeats> </pos PREP> </mfeats> </syn @ADVL> </base "on"> </lfeats > </pos ADV> </mfeats ADVL> </syn @ADVL> floppy_disks </base "floppy_disk"> </lfeats > </pos N> </mfeats NOM PL> </syn @<P>,and </base "and"> </lfeats > </pos CC> </mfeats> </syn @CC> you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2> </syn @SUBJ> install </base "install"> </lfeats <SVO>> </pos V> </mfeats PRES -SG3 VFIN> </syn @+FMAINV> them </base "they"> </lfeats <NonMod>> </pos PRON> </mfeats PERS ACC PL3> </syn @OBJ> by </base "by"> </lfeats > </pos PREP> </mfeats> </syn @ADVL> copying </base "copy"> </lfeats <SVO> <SV> <Pfor>> </pos PCP1> </mfeats> </syn @<P-FMAINV> them </base "they"> </lfeats <NonMod>> </pos PRON> </mfeats PERS ACC PL3> </syn @OBJ> from </base "from"> </lfeats> </pos PREP> </mfeats > </syn @ADVL> the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>> floppy_disks </base "floppy_disk"> </lfeats > </pos N> </mfeats NOM PL> </syn @<P> to </base "to"> </lfeats> </pos PREP> </mfeats > </syn @<NOM @ADVL> your </base "you"> </lfeats> </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>> hard_disk </base "hard_disk"> </lfeats> </pos N> </mfeats NOM SG> </syn @<P>.
Some </base "some"> </lfeats <*> <Quant>> </pos DET> </mfeats CENTRAL SG/PL> </syn @QN>> programs </base "program"> </lfeats> </pos N> </mfeats NOM PL> </syn @SUBJ> have </base "have"> </lfeats <SVO> <SVOC/A>> </pos V> </mfeats PRES -SG3 VFIN> </syn @+FMAINV> special </base "special"> </lfeats > </pos A> </mfeats ABS> </syn @AN>> installation </base "installation"> </lfeats> </pos N> </mfeats NOM SG> </syn @OBJ @NN>> instructions </base "instruction"> </lfeats > </pos N> </mfeats NOM PL> </syn @OBJ>.
See </base "see"> </lfeats <*> <as/SVOC/A> <SVO> <SV> <InfComp>> </pos V> </mfeats IMP VFIN> </syn @+FMAINV> the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>> documentation </base "documentation"> </lfeats <-Indef>> </pos N> </mfeats NOM SG> </syn @OBJ> that </base "that"> </lfeats <NonMod> <**CLB> <Rel>> </pos PRON> </mfeats SG/PL> </syn @SUBJ> came </base "come"> </lfeats <SVC/A> <SV> <Pfor>> </pos V> </mfeats PAST VFIN> </syn @+FMAINV> with </base "with"> </lfeats > </pos PREP> </mfeats > </syn @ADVL> your </base "you"> </lfeats > </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>> programs </base "program"> </lfeats > </pos N> </mfeats NOM PL> </syn @<P>.
</epara>
</para>
To </base "to"> </lfeats <*>> </pos INFMARK>> </mfeats > </syn @INFMARK>> use </base "use"> </lfeats <as/SVOC/A> <SVO> <SV>> </pos V> </mfeats INF> </syn @-FMAINV> your </base "you"> </lfeats > </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>> programs </base "program"> </lfeats > </pos N> </mfeats NOM PL> </syn @OBJ> most </base "much"> </lfeats> </pos ADV> </mfeats SUP> </syn @ADVL @AD-A>> </base "much"> </lfeats <Quant>> </pos PRON> </mfeats SUP SG> </syn @OBJ @PCOMPL-O> </base "many"> </lfeats <Quant>> </pos PRON> </mfeats SUP PL> </syn @OBJ @PCOMPL-O> effectively </base "effective"> </lfeats <DER:ive> <DER:ly>> </pos ADV> </mfeats> </syn @ADVL> :

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</epara>
</list>
</item> Put </base "put"> </lfeats <*> <SVO>> </pos PCP2> </mfeats > </syn  NPHR
@PCOMPL-O> only </base "only"> </lfeats > </pos ADV> </mfeats > </syn @AD-A>> one
</base "one"> </lfeats > </pos NUM> </mfeats CARD> </syn @QN>> copy </base "copy">
</lfeats > </pos N> </mfeats NOM SG> </syn @NPHR @OBJ> of </base "of"> </lfeats > </pos
PREP> </mfeats > </syn @<NOM-OP> each </base "each"> </lfeats <Quant>> </pos DET>
</mfeats CENTRAL SG> </syn @QN>> program </base "program"> </lfeats > </pos N> </mfeats
NOM SG> </syn @<P> on </base "on"> </lfeats > </pos PREP> </mfeats> </syn @<NOM
@ADVL> your </base "you"> </lfeats > </pos PRON> </mfeats PERS GEN SG2/PL2> </syn
@GN>> hard_disk </base "hard_disk"> </lfeats> </pos N> </mfeats NOM SG> </syn @<P>.
Having </base "have"> </lfeats <*> <SVO> <SVOC/A>> </pos PCP1> </mfeats > </syn @-
FMAINV> more=than </base "more=than"> </lfeats > </pos ADV> </mfeats > </syn @ADVL
@AD/A>> one </base "one"> </lfeats > </pos NUM> </mfeats CARD> </syn @QN>> copy
</base "copy"> </lfeats > </pos N> </mfeats NOM SG> </syn @SUBJ> can </base "can">
</lfeats > </pos V> </mfeats AUXMOD VFIN> </syn @+FAUXV> cause </base "cause"> </lfeats
<SVO> <SVOO>> </pos V> </mfeats INF> </syn @-FMAINV> errors </base "error"> </lfeats>
</pos N> </mfeats NOM PL> </syn @OBJ>.
</citem>
</item> Whenever </base "whenever"> </lfeats <*> <**CLB>> </pos ADV> </mfeats WH> </syn
  ADVL> you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2>
</syn @SUBJ> copy </base "copy"> </lfeats <SVO> <SV> <P/ob>> </pos V> </mfeats PRES -
SG3 VFIN> </syn @+FMAINV> a </base "a"> </lfeats <Indef>> </pos DET> </mfeats CENTRAL
ART SG> </syn @DN>> program </base "program"> </lfeats > </pos N> </mfeats NOM SG>
</syn @NN>> disk </base "disk"> </lfeats> </pos N> </mfeats NOM SG> </syn @OBJ> to
</base "to"> </lfeats> </pos PREP> </mfeats> </syn @<NOM @ADVL> your </base "you">
</lfeats > </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>> hard_disk </base
"hard_disk"> </lfeats > </pos N> </mfeats NOM SG> </syn @<P>,be </base "be"> </lfeats <SV>
<SVC/N> <SVC/A>> </pos V> </mfeats SUBJUNCTIVE VFIN> </syn @+FMAINV> careful
</base "careful"> </lfeats > </pos A> </mfeats ABS> </syn @PCOMPL-S> not </base "not">
</lfeats> </pos NEG-PART> </mfeats > </syn @NEG> to </base "to"> </lfeats> </pos
INFMARK>> </mfeats > </syn @INFMARK>> copy </base "copy"> </lfeats <SVO> <SV> <P/ob>>
</pos V> </mfeats INF> </syn @-FMAINV> a </base "a"> </lfeats <Indef>> </pos DET> </mfeats
CENTRAL ART SG> </syn @DN>> System </base "system"> </lfeats <*>> </pos N> </mfeats
NOM SG> </syn @NN>> Folder </base "folder"> </lfeats <*> <DER:er>> </pos N> </mfeats
NOM SG> </syn @OBJ>.
Always </base "always"> </lfeats <*>> </pos ADV> </mfeats ADVL> </syn @ADVL> check
</base "check"> </lfeats <SVO> <SV> <P/for> <P/with> <P/on>> </pos V> </mfeats IMP VFIN>
</syn @+FMAINV> </base "check"> </lfeats> </pos N> </mfeats NOM SG> </syn @SUBJ> to
</base "to"> </lfeats > </pos INFMARK>> </mfeats > </syn @INFMARK>> see </base "see">
</lfeats <as/SVOC/A> <SVO> <SV> <InfComp>> </pos V> </mfeats INF> </syn @-FMAINV
@<NOM-FMAINV> what </base "what"> </lfeats <NonMod> <**CLB>> </pos PRON> </mfeats
WH SG/PL> </syn @SUBJ @OBJ> you </base "you"> </lfeats <NonMod>> </pos PRON>
</mfeats PERS NOM SG2/PL2 SUBJ> </syn @SUBJ> 've </base "have"> </lfeats <SVO>> </pos
V> </mfeats PRES -SG3 VFIN> </syn @+FAUXV> copied </base "copy"> </lfeats <SVO> <SV>
<P/ob>> </pos PCP2> </mfeats > </syn @-FMAINV>,and </base "and"> </lfeats> </pos CC>
</mfeats > </syn @CC> drag </base "drag"> </lfeats <SVO> <SV>> </pos V> </mfeats IMP
VFIN> </syn @+FMAINV> </base "drag"> </lfeats <SVO> <SV>> </pos V> </mfeats INF> </syn
@-FMAINV> </base "drag"> </lfeats <SVO> <SV>> </pos V> </mfeats PRES -SG3 VFIN> </syn
@+FMAINV> any </base "any"> </lfeats <Quant>> </pos DET> </mfeats CENTRAL SG/PL>
</syn @QN>> extra </base "extra"> </lfeats> </pos A> </mfeats ABS> </syn @AN>> System
</base "system"> </lfeats <*>> </pos N> </mfeats NOM SG> </syn @OBJ @APP @NN>>
Folders </base "folder"> </lfeats <*> <DER:er>> </pos N> </mfeats NOM PL> </syn @SUBJ
@OBJ @APP> to </base "to"> </lfeats> </pos PREP> </mfeats > </syn @<NOM @ADVL> the
</base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>> Trash
</base "trash"> </lfeats <*> <-Indef>> </pos N> </mfeats NOM SG> </syn @<P>.
</citem>
</item> If </base "if"> </lfeats <*> <**CLB>> </pos CS> </mfeats> </syn @CS> a </base "a">
</lfeats <Indef>> </pos DET> </mfeats CENTRAL ART SG> </syn @DN>> program </base
"program"> </lfeats> </pos N> </mfeats NOM SG> </syn @SUBJ> malfunctions </base
malfunction"> </lfeats <SV>> </pos V> </mfeats PRES SG3 VFIN> </syn @+FMAINV>
consistently </base "consistent"> </lfeats <DER:ly>> </pos ADV> </mfeats > </syn @ADVL>, try
</base "try"> </lfeats <SVO> <SV> <P/for>> </pos V> </mfeats IMP VFIN> </syn @+FMAINV>
</base "try"> </lfeats > </pos N> </mfeats NOM SG> </syn @APP @NN>> installing </base
"instal"> </lfeats <SVO>> </pos PCP1> </mfeats > </syn @OBJ @APP @<NOM-FMAINV @-
FMAINV> a </base "a"> </lfeats <Indef>> </pos DET> </mfeats CENTRAL ART SG> </syn
@DN>> fresh </base "fresh"> </lfeats > </pos A> </mfeats ABS> </syn @AN>> copy </base
"copy"> </lfeats > </pos N> </mfeats NOM SG> </syn @OBJ>.
If </base "if"> </lfeats <*> <**CLB>> </pos CS> </mfeats > </syn @CS> that </base "that"
</lfeats > </pos PRON> </mfeats DEM SG> </syn @SUBJ> does </base "do"> </lfeats <SVO>
<SVOO> <SV>> </pos V> </mfeats PRES SG3 VFIN> </syn @+FAUXV> not </base "not">
</lfeats > </pos NEG-PART> </mfeats > </syn @NEG> help </base "help"> </lfeats <SVO> <SV>
<InfComp> <P/with>> </pos V> </mfeats INF> </syn @-FMAINV> find </base "find"> </lfeats
<SVOO> <SVOC/N> <SVOC/A> <SVO> <SV> <P/for>> </pos V> </mfeats IMP VFIN> </syn
@+FMAINV> </base "find"> </lfeats <SVOO> <SVOC/N> <SVOC/A> <SVO> <SV> <P/for>>
</pos V> </mfeats INF> </syn @-FMAINV> out </base "out"> </lfeats> </pos ADV> </mfeats
ADVL> </syn @ADVL> from </base "from"> </lfeats> </pos PREP> </mfeats > </syn @ADVL>
the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>>
software </base "software"> </lfeats <-Indef>> </pos N> </mfeats NOM SG> </syn @NN>>
manufacturer </base "manufacturer"> </lfeats <DER:er>> </pos N> </mfeats NOM SG> </syn
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@<P> whether </base "whether"> </lfeats <*°CLB>> </pos CS> </mfeats > </syn @CS> your </base "you"> </lfeats> </pos PROD </mfeats PERS GEN SG2/PL2> </syn @GN>> version </base "version"> </lfeats> </pos N> </mfeats NOM SG> </syn SUBJ> of </base "of"> </lfeats > </pos PREP> </mfeats > </syn @<NOM-OF> the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>> program </base "program"> </lfeats> </pos N> </mfeats NOM SG> </syn @<P> is </base "be"> </lfeats <SV> <SVC/N> <SVC/A>> </pos V> </mfeats PRES SG3 VFIN> </syn @+FMAINV> compatible </base "compatible"> </lfeats <DER:ble>> </pos A> </mfeats ABS> </syn @PCOMPL-S> with </base "with"> </lfeats > </pos PREP> </mfeats > </syn @<NOM @ADVL> the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>> system </base "system"> </lfeats > </pos N> </mfeats NOM SG> </syn @NN>> software </base "software"> </lfeats <-Indef>> </pos N> </mfeats NOM SG> </syn @<P> you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2 SUBJ> </syn @SUBJ> 're </base "be"> </lfeats <SV> <SVC/N> <SVC/A>> </pos V> </mfeats PRES -SG1,3 VFIN> </syn @+FMAINV @+FAUXV> using </base "use"> </lfeats <as/SVOC/A> <SVO> <SV>> </pos PCP1> </mfeats > </syn @-FMAINV>.

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See </base "see"> </lfeats <*> <as/SVOC/A> <SVO> <SV> <InfComp>> </pos V> </mfeats IMP VFIN> </syn @+FMAINV> Chapter </base "chapter"> </lfeats <*>> </pos N> </mfeats NOM SG> </syn @OBJ @NN>> 5 </base "5"> </lfeats > </pos NUM> </mfeats CARD> </syn @OBJ @PCOMPL-O @QN> @<NOM @ADVL>," Adapting </base "adapt"> </lfeats <*> <SVO> <SV> <P/for>> </pos PCP1> </mfeats > </syn @OBJ @PCOMPL-S @PCOMPL-O @APP @-FMAINV @AN>> Your </base "you"> </lfeats <*>> </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>> Computer </base "computer"> </lfeats <*> <DER:er>> </pos N> </mfeats NOM SG> </syn @OBJ> to </base "to"> </lfeats> </pos PREP> </mfeats> </syn @<NOM @ADVL> Your </base "you"> </lfeats <*>> </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>> Own </base "own"> </lfeats <*>> </pos A> </mfeats ABS> </syn @AN>> Use </base "use"> </lfeats <*>> </pos N> </mfeats NOM SG> </syn @<P>.

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</item> To </base "to"> </lfeats <*>> </pos INFMARK>> </mfeats > </syn @INFMARK>> open </base "open"> </lfeats <SVO> <SV>> </pos V> </mfeats INF> </syn @-FMAINV> a </base "a"> </lfeats <Indef>> </pos DET> </mfeats CENTRAL ART SG> </syn @DN>> program </base "program"> </lfeats > </pos N> </mfeats NOM SG> </syn @OBJ> automatically </base "automatical"> </lfeats <DER:ic> <DER:al> <DER:ly>> </pos ADV> </mfeats > </syn @ADVL @AD-A>> each </base "each"> </lfeats <Quant>> </pos DET> </mfeats CENTRAL SG> </syn @QN>> time </base "time"> </lfeats > </pos N> </mfeats NOM SG> </syn @OBJ @ADVL> you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2> </syn @SUBJ> start </base "start"> </lfeats <SV> <SVO> <P/on>> </pos V> </mfeats PRES -SG3 VFIN> </syn @+FMAINV> up </base "up"> </lfeats> </pos ADV> </mfeats ADVL> </syn @ADVL>,you </base "you"> </lfeats <NonMod>> </pos PRON> </mfeats PERS NOM SG2/PL2> </syn @SUBJ> can </base "can"> </lfeats > </pos V> </mfeats AUXMOD VFIN> </syn @+FAUXV> put </base "put"> </lfeats <SVO>> </pos V> </mfeats INF> </syn @-FMAINV> the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>> program </base "program"> </lfeats > </pos N> </mfeats NOM SG> </syn @OBJ> (or </base "or"> </lfeats > </pos CC> </mfeats> </syn @CC> its </base "it"> </lfeats> </pos PRON> </mfeats GEN SG3> </syn @GN>> alias </base "alias"> </lfeats > </pos N> </mfeats NOM SG> </syn @SUBJ @OBJ>) into </base "into"> </lfeats > </pos PREP> </mfeats > </syn @ADVL> the </base "the"> </lfeats <Def>> </pos DET> </mfeats CENTRAL ART SG/PL> </syn @DN>> Startup </base "startup"> </lfeats <*>> </pos N> </mfeats NOM SG> </syn @NN>> Items </base "item"> </lfeats <*>> </pos N> </mfeats NOM PL> </syn @NN>> folder </base "folder"> </lfeats <DER:er>> </pos N> </mfeats NOM SG> </syn @<P>.

See </base "see"> </lfeats <*> <as/SVOC/A> <SVO> <SV> <InfComp>> </pos V> </mfeats IMP VFIN> </syn @+FMAINV> Chapter </base "chapter"> </lfeats <*>> </pos N> </mfeats NOM SG> </syn @OBJ @NN>> 5 </base "5"> </lfeats > </pos NUM> </mfeats CARD> </syn @OBJ @PCOMPL-O @QN> @<NOM @ADVL>,"Adapting </base "adapt"> </lfeats <*> <SVO> <SV> <P/for>> </pos PCP1> </mfeats> </syn @OBJ @PCOMPL-S @PCOMPL-O @APP @-FMAINV @AN>> Your </base "you"> </lfeats <*>> </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>> Computer </base "computer"> </lfeats <*> <DER:er>> </pos N> </mfeats NOM SG> </syn @OBJ> to </base "to"> </lfeats> </pos PREP> </mfeats> </syn @<NOM @ADVL> Your

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</base "you"> </lfeats <*>> </pos PRON> </mfeats PERS GEN SG2/PL2> </syn @GN>> Own
</base "own"> </lfeats <*>> </pos A> </mfeats ABS> </syn @AN>> Use </base "use"> </lfeats
<*>> </pos N> </mfeats NOM SG> </syn @<P>.
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EXAMPLE F

Knowledge Mining Stage

As was discussed earlier, an object of the present invention is to automatically derive a domain catalog from an online technical document. The primary task of step **331** is to identify and extract important words or phrases deemed sufficiently representative of the domain to which the documentation is directed and incorporate these into the domain catalog. The underlying apparatus for accomplishing that task is a pattern matching engine. Given a merged file containing linguistically annotated ASCII text and markup information as provided by steps in linguistic analysis stage **300**, the pattern matching engine of the present invention searches at step **331** for instances of particular syntactic patterns to identify information sufficiently representative of the domain, that is, the pattern matching engine mines for knowledge by searching for selected syntactic patterns in the text. Importantly, there is no semantic analysis, per se, of the text of the document. Although there is identification of semantically close units, the present invention does not use such information for sentence interpretation.

Beginning with the proposition that a document describes a domain, it may be said that what is used in this description are the key terms in the domain, the kind of relations, i.e., actions in which the key terms participate, the kind of structures or groupings that subsets of these key terms form, the kind of properties which are associated with these key terms, and the kind of associations that exist between key terms and between relations in the domain. Therefore, it is these kinds of domain characteristics that are sought out in the knowledge mining stage, and incorporated into the domain catalog.

To illustrate with reference to FIG. 5, a page of text **500** representative of a page of text from a technical document is shown. In this particular illustration, page **500** is taken from an online copy of the Apple Macintosh Reference guide, Chapter 2. The domain, or topic, to which the document is generally directed could be said to be "disks", as is apparent from the repeated occurrence of that term in the text. The key terms in the domain are shown as nodes in a lexical network **501** (i.e., a domain catalog), and are comprised of "disk" **502**, "floppy disk" **503**, "hard disk" **504**, "internal hard disk" **505** and "external hard disk" **506**. The kind of relations in which the key terms participate, reduced to their morphological base forms, are "initialize" **507** and "erase" **508**, applicable to all disks, "eject" **509**, applicable only to floppy disks, and "share with others" **510**, applicable to hard disks, either internal or external. Thus, a relationship can be thought of as a verb, and the key terms to which it applies can be thought of as noun phrases in argument positions to it.

The structure imposed on the key terms can be characterized as forming a hierarchical tree, in which internal hard disk and external hard disk are subsets of hard disk, which, in turn, along with floppy disk, is a subset of disk. The properties with which the key terms are associated are "name" **511**, associated with disk, and "SCSI id No." associated with hard disk. At first glance, properties may appear no different than a key term in the domain. Both key terms and properties are noun phrases. However, a property is generally a noun phrase related to or associated with a noun phrase that is a key term. Additionally, a property could be, for example, a predicate adjective, e.g., "disks came preinitialized". A property occurs less frequently than a key term within the document, and does not have the same discourse behavior, i.e., it does not appear in the same position of syntactical patterns as do key terms.

It will be seen that a lexical network of the kind illustrated in FIG. **5** may be derived from the merged file (containing text and markup information, an example of which is found in example F) passed to knowledge mining stage **330** from linguistic analysis stage **300**.

The model for this to happen is that certain semantically prominent or important terms, relations, and properties repeatedly manifest themselves as syntactic structures or patterns. The pattern matching engine can thus be used as a mining tool to obtain, via syntactic structure, the semantic relation underlying the structure. For example, generally, a key term in the domain typically maps onto a noun phrase; an activity between two key terms in the domain might map onto a subject-verb-object phrase or, generally, a verb with arguments construction. Thus, the pattern matching engine of the present invention searches for such syntactic structures or patterns in order to locate the key terms, relations and properties of the domain. Linguistic analysis stage **300** provides in annotated form the linguistic information needed to successfully search for the syntactic patterns underlying the text of the document.

In the context of technical documentation, the most representative information of such text is its set of technical terms. The key terms of a domain are generally comprised of the technical terms of the domain. Moreover, in technical documentation, technical terms consist primarily of noun phrases, as is indicated by the key terms illustrated in FIG. **5**. Thus, referring to FIG. **6**, in constructing the domain catalog, the pattern matching engine of the present invention may begin knowledge mining at step **601** by first searching for, as an example, noun phrases indicative of technical terminology. It should be understood that the complete set of technical terms are not defined in terms of their syntactic structure according to any rigid set of rules. There are, obviously, a number of syntactical patterns, or variations on patterns provided in the examples that follow, which, depending on the type or content of the technical documentation, would similarly represent common syntactic structures of technical terminology.

Referring now to FIG. **7**, the page of text **500** representative of a page of text from the Apple Reference guide that ships with every Apple Macintosh computer is shown. In identifying technical terminology, the syntactic pattern matching engine of the present invention searches the document, looking for a predefined syntactic pattern such as pattern **800** in FIG. **8**. Pattern **800** identifies a noun phrase consisting of any number of adjectives or nouns followed by a noun and, optionally followed by a trailing prepositional phrase beginning with the preposition "of". By applying

pattern 800 to the page of text 500 of FIG. 7, the technical terms highlighted in FIG. 9 are discovered. This pattern discovers multi-token terms, for example, "hard disk" 901, or "floppy disk" 902. Furthermore, even though the pattern may find a term with a prepositional trailing prepositional phrase, the prepositional phrase is not considered or identified as part of the technical term proper.

Those terms that are found by the pattern matching engine as matching syntactic pattern 800 are maintained in a list of technical terms such as list 801 of FIG. 8. List 801 is a representation of the topmost portion of a list of technical terms found in the Apple Macintosh Reference guide as matching pattern 800. Two columns of information are present in list 801. The first column 802 contains numbers indicating the frequency with which technical terms in column 803 occur. For example, in mining for technical terms, the term "control panel" in row 804 was detected in the document 61 times, whereas "system folder" in row 805 was detected 34 times.

Earlier it was stated that pattern 800 discovers primarily multi-token terms, yet one may observe a number of single token terms in list 801, e.g., "menu", "file", and "disk". This is because neutral premodifiers, i.e., adjectives or nouns that are common in the language, are discarded. Thus, for example, the pattern "another menu" matches pattern 800, but the modifier "another" simply acts as linguistic glue, it is not a component of the key term "menu." Neutral modifiers are stripped, thus, "another menu" reduces to "menu".

Importantly, the pattern matching engine scans the merged file containing both linguistically annotated text and markup information, as illustrated in example F, when searching for technical terminology. In so doing, the present invention takes into account the markup information when determining the importance of identified technical terminology. If for example, a technical term is identified in a chapter, section, subsection or within a page of a document, location within a page of a document, the present invention adjusts the weight of importance of the technical term so identified by incrementing the frequency of occurrence for the given technical term. As will be seen later, frequency of occurrence of a technical term is a factor in determining whether it is considered key and thus, incorporated into the domain catalog. Thus, the list of technical terminology forms the basis for the key terms to be incorporated into the domain catalog.

Referring now to FIG. 6, the next step (step 602) in mining the merged file for knowledge involves mining for manifestations of domain primitives. A domain primitive is a primary information structuring device in a domain, typically involving, for example, key terms, an action related to or involving a key term, or a property associated with a key term.

Importantly, while key terms are generally noun phrases, not every noun phrase is a key term. As will be seen, once having found key term candidates (or the technical terms deemed to be key terms based on the frequency of their occurrence or their proximity to markup information in the text) via the pattern matching engine, a subsequent step is to search for other syntactic patterns to identify actions related to or involving key terms, for example, a syntactic pattern in which a verb is followed by an object.

(It should be noted here that an object does not have to "follow" a verb in a contiguous sense to have a valid verb-object phrase. Rather, the verb and the object need only compose, i.e., go together. Thus, the phrase, "hard disks are preinitialized" is as valid as the phrase "initialize hard disks" notwithstanding the fact that the object precedes the verb.)

If the pattern matching engine detects a verb-object phrase in which the object is simply a noun phrase and not a key term, the result may not be important in terms of identifying relations involving key terms, because it is possible the noun phrase was not identified as a technical term according to the syntactic pattern used for identifying technical terms. Thus, the pattern matching engine must identify not only particular syntactic patterns, but patterns in which, for example, the object in a verb-object phrase is a key term, as previously identified in step 601. It is for that reason that there is a separation in the steps of identification of technical terminology at step 601 and mining for manifestations of domain primitives (e.g., occurrences of relations and properties) at step 602.

Thus, importantly, the pattern matching engine of the present invention does not just search for a particular syntactic pattern defined in terms of linguistic categories alone (e.g., a verb-object phrase when searching for an action, or a noun phrase followed by the preposition "of", followed by another noun phrase when searching for a property). Rather, the pattern matching engine searches for a particular syntactic pattern sanctioned by membership of its arguments in the list of already identified key terms, for example, a verb-object phrase where the object (or a possible contraction or variation of one) is a key term. As another example, the pattern matching engine searches for a noun phrase followed by the preposition "of", followed by another noun phrase where the second noun phrase is a key term and preferably, the first noun phrase is a key term as well.

Referring to FIG. 10, representative examples of the types of syntactic patterns involving key terms used to locate relations and properties associated with key terms are shown. In identifying relations, the syntactic pattern matching engine of the present invention searches the document looking for, as an example, syntactic pattern 1007. Pattern 1007 identifies a verb-object phrase in which the object is a noun phrase identified as a key term. By applying pattern 1007 to the page of text 500 of FIG. 7, the relation 1001 "initializing a hard disk" is located. It is then stored in an observations file 1010 as observation 1004 "initialize hard disk". (The present participle "initializing" has already been reduced to its morphological base form "initialize".) Referring to FIG. 11, verb "Initializing" 1101 is circled to indicate a relation with a key term, in this example, "hard disk" 901, has been identified.

Yet another relation may be identified by looking for, as an example, syntactic pattern 1008. Pattern 1008 identifies a syntactic pattern comprising a verb followed by a conjunction and a verb-object phrase in which the object is a noun phrase identified as a key term. By applying pattern 1008 to the page of text 500 of FIG. 7, the relation 1002 "testing and repairing disks" is located. It is stored in observations file 1010 as two separate relations at observation 1005, "test hard disk" and "repair hard disk". As in the previous example, the present participles "testing" and "repairing" are reduced to their morphological base forms "test" and "repair". Referring to FIG. 11, verbs "Testing" 1102 and "Repairing" 1103 are circled indicating a relation with a key term has been located.

The last example presented in FIG. 10 identifies a property. The pattern looks for a post-nominal modification of a noun phrase (a subject noun phrase) by an adjective. The adjective is called the "property" of the term in the subject noun phrase position. If such a pattern is found, the pattern matching engine of the present invention identifies a property. By applying pattern 1009 to the page of text 500, the

property 1003 "most hard disks are pre-initialized" is found. It is stored in observations file 1010 as observation 1006 "hard disk |be| pre-initialized". Referring to FIG. 11, the adjective "pre-initialized" is circled indicating it is a property of the key term "hard disks" 1105.

FIG. 12 provides further examples of mining for manifestations of domain primitives, in this example, involving identification of properties, e.g., property 1201 is found by searching for a possessive form of a key term followed by a noun. Properties 1202, 1203, and 1204 are identifiable by a syntactic pattern comprising a noun phrase followed by a prepositional phrase beginning with the preposition "of" and ending with a noun phrase in which the noun phrase is identified as a key term.

In summary, the notion of mining for manifestations of domain primitives is to first identify technical terminology as discussed above with reference to step 601. Then, at step 602, rather than blindly search for further pertinent information to be incorporated into the domain catalog, i.e., manifestations of relations and properties, use the key terms as a reference, or anchor points, for further mining expeditions. For example, a manifestation of a relation can be assumed to be much more important if it has been sanctioned by a key term, in the sense that there are multiple occurrences of a key term, e.g., "hard disk" and a relation it participates in, e.g., "initialize" (or derivatives and inflections thereof as a result of morphological analysis) in the same document. The more often there is a syntactic collocation, i.e., a repeated occurrence in identical syntactic roles between a term and a manifestation of a relation or property, the more important the manifestation. Thus, the importance of a manifestation of a domain primitive is defined by its frequency of co-occurrence with a key term in like syntactic roles. In order to make that observation, linguistic analysis must first determine, for example, that "disk" is a noun and it is in object position with respect to the verb "initialize".

At this point in knowledge mining step 331, it is unknown which of the observed and recorded manifestations of relations and properties with respect to key terms are important. The observations file might contain, for example, "purchase hard disk"—all that has been identified at this point is a manifestation of a relation with a key term. Thus, the observations file can become very large. However, as will be seen, frequency analysis of manifestations of domain primitives is carried out at step 604. At that step, a decision is made to retain manifestations of domain primitives of sufficient prominence, such as the relation "initialize hard disk", but discard manifestations of domain primitives such as the relation "purchase hard disk", on the basis of frequency of occurrence in the observations file.

Importantly, this observation by the present invention of collocation with respect to the syntactic structure of a sentence does not require semantic analysis or even full syntactic analysis. The output of the shallow syntactic analyzer at step 303 provides sufficient information to detect the presence of, for example, a subject-verb-object or verb-object phrase, and thus, trigger the knowledge mining process. It is immaterial that there may be 25 words between the verb and the object—collocation of syntactic roles is unaffected.

Referring to FIG. 6, at step 603, the discourse context of each sentence or phrase in the merged file is analyzed to more accurately record in the observations file the list of manifestations of domain primitives and avoid incomplete recording of linguistic observations. This analysis is done on the output of the pattern matching engine, rather than on all of the text prior to the pattern matching. Discourse analysis takes into consideration the way in which text is written. For example, it is common to substitute a pronoun for a technical term, or to contract a term. Discourse analysis performs such functions as expanding contractions and substituting pronouns with their antecedent form. Take, for example, the two sentences beginning at 1106 in FIG. 11, which state, "If your hard disk does not appear on the desktop, first try to repair it . . . If you can't repair the disk, use the . . . to reinitialize the disk." If the pattern matching engine of the present invention only performs syntactic pattern matching, and it is attempting to sanction the occurrence of patterns where "hard disk" appears in the object position of a noun phrase, it will locate phrases such as "initializing a hard disk" and "hard disk is erased". However, in the example provided, while the pattern matching engine will locate a verb-object phrase ("repair" and "it"), it will not do anything with the phrase because the object "it" is not a term itself, even though as a pronoun "it" has a valid antecedent basis, i.e., the pronoun "it" refers back to the term "hard disk". Likewise, the pattern matching engine will fail to locate the relation "reinitialize the disk" because "disk" is not "hard disk", but a contraction thereof. Thus, even though one may readily observe "it" refers to "hard disk" and "the disk" is a contraction of "hard disk", the pattern matching engine, without discourse analysis, will fail to appropriately react to these common uses of language.

Having performed discourse analysis at step 603 to, for example, resolve pronoun references to their antecedent basis or to expand phrase contractions to their full form as they have been introduced in the discourse earlier, it is "repair hard disk" that gets recorded as a manifestation of a verb-object relation with "hard disk" in the object position, not simply the pronoun "it". Likewise, "reinitialize the disk" is recognized as "reinitialize the hard disk". As a result of discourse analysis, relation 1002 in FIG. 10 resolves to "testing and repairing hard disks". The observations recorded in the observations file at 1005 reflect this analysis. A further observation made at this point is the use of the conjunction "and" which distributes the object "hard disk" to both "testing" and "repairing", thus, the two entries in the observations file at 1005: "test hard disk" and "repair hard disk".

Referring again to FIG. 6, the next step, step 604, analyzes the frequency of manifestations of domain primitives to determine on that basis those relations and properties which are important and representative of the domain and those that are not. Those manifestations that are not important nor representative of the domain, e.g., "purchase a hard disk", are discarded.

Step 605 contemplates expanding the list of key terms by finding terms that are closely related in the domain to a term already known as important, i.e., a key term. The list of key terms is expanded upon, essentially by attempting to find terms that failed to be located up to this point in the process of mining. For example, the technical terminology identification analysis at step 601 required that the length of a noun phrase be at least two tokens in length, i.e., either an adjective or noun, followed by another noun. Terms of one token in length, therefore, were not located. Expanding the list of key terms involves first scanning the observations file to locate a relation which has been deemed important because of its discourse context and frequency of occurrence as determined at steps 603 and 604, respectively. Then, the observations file is searched to locate tokens, e.g., nouns, that are closely related to a domain primitive already deemed important. In this way, the pattern matching engine

terms may be established. Importantly, it is the linguistic processes of the present invention that establish the semantic relationship purely on the basis of observing regular syntactic patterns in the text source from which the terms were derived. For example, the term "document" may have as its set of relations open, close, resize, and delete. The term "file" shares a similar set of relations: open, close, and delete. Likewise with the term "window". Thus, there is some sense in which file, document and window are similar in that they repeatedly appear in similar syntactic environments, i.e., they have the same relations associated with them. The clustering is not on the basis of words or even tokens, but rather on phrases. Moreover, the clustering involves only the phrases which are deemed important.

Clustering key terms for topicality on the basis of proximity is entirely different than clustering on the basis of similarity of use. Clustering on the basis of proximity involves clustering terms on the basis of their physical position in the text with respect to other terms. This process, at a certain level of abstraction, is essentially accomplished by scanning the text with a window through which a fixed number of terms and phrases at any given time is visible. Any time the same two terms or phrases appear in the window, a counter is incremented. At the end of scanning the entire document, a matrix exists providing the frequency of close co-occurrence of a term with respect to each other term in the document, i.e., the result of the process is a measure of how often a term was seen in the window (across the entire document) with each other term. For example, if a term such as "RAM disk" is seen with enough frequency in the physical proximity of another term such as "battery power", while the terms would not be related in terms of similarity of use, the fact that they occur often (relatively speaking) in close proximity with one another suggests there is some semantic or domain connection between the two. By establishing a cross reference between terms according to proximity measures, an additional method is established for navigating through the domain catalog on the basis of semantic relatedness.

Thus, a method involving computer-mediated linguistic analysis of online technical documentation to extract and catalog from the documentation knowledge essential to, for example, creating a online help database useful in providing online assistance to users in performing a task is described.

I claim:

1. In a computer system having access to online documentation, a method of extracting knowledge from said online documentation, comprising the steps of:

a) linguistically analyzing and annotating text of said online documentation to create a linguistically analyzed and annotated text;

b) mining said linguistically analyzed and annotated text for text representative of said online documentation, including the steps of:

i) searching for syntactic patterns indicative of key terms and maintaining a list of said key terms;

ii) searching for syntactic patterns indicative of manifestations of a domain primitive involving one of said key terms and maintaining a list of said manifestations; and

iii) analyzing said list of said manifestations to determine said manifestations that are representative of said online documentation on the basis of frequency of their occurrence; and

c) combining said list of said key terms and said list of said manifestations that are representative of said online documentation in a domain catalog.

2. The method of claim 1, wherein said online documentation comprises online technical documentation.

3. The method of claim 1, wherein said key terms comprise technical terms and said list of said key terms comprises a list of said technical terms.

4. In a computer system having access to online technical documentation, a method of extracting knowledge from said online technical documentation, comprising the steps of:

a) linguistically analyzing and annotating text of said online technical documentation to create a linguistically analyzed and annotated text, including the steps of:

i) lexically and morphologically analyzing said text;

ii) disambiguating between possible parts-of-speech for each word of said text and identifying a syntactic function for each word of said text;

b) mining said linguistically analyzed and annotated text for text representative of said online technical documentation, including the steps of:

i) searching for syntactic patterns indicative of technical terms and maintaining a list of said technical terms and the frequency with which said technical terms occur in said text;

ii) searching for syntactic patterns indicative of manifestations of a domain primitive involving one of said technical terms and maintaining a list of said manifestations;

iii) analyzing said list of said manifestations to determine said manifestations that are representative of said online technical documentation on the basis of frequency of their occurrence;

iv) expanding said list of technical terms by searching said list of said manifestations for syntactic patterns involving additional terms not presently in said list of said technical terms that are adjunct to said manifestations and,

v) searching said online technical documentation for lexico-syntactic patterns indicative of larger relations involving said technical terms, said additional terms and said manifestations; and

c) combining said technical terms, said additional terms, said manifestations, and said larger relations in a domain catalog.

5. The method of claim 4, wherein said online technical documentation is stored in an American Standard Code for Information Interchange, hereinafter referred to as ASCII, data file conforming with a standard internal representation for document structure.

6. In a computer system having access to an online technical document, a method of extracting knowledge from said online technical document, comprising the steps of:

a) translating an American Standard Code for Information Interchange, hereinafter referred to as ASCII, data file having stored therein said online technical document and information regarding a proprietary internal representation for said online technical document to a second ASCII data file having stored therein said online technical document and information regarding a standard internal representation for said online technical document;

b) separating text of said online technical document from said information regarding said standard internal representation for said online document;

c) linguistically analyzing and annotating said text of said online technical documenta to create a linguistically analyzed and annotated text, including the steps of:

i) lexically and morphologically analyzing said text to determine possible lexical and morphological features;

ii) disambiguating between possible parts-of-speech for each word of said text and identifying a syntactic function for each word of said text;

d) labeling each word of said text and said annotations;

e) combining said linguistically analyzed and annotated text with said information regarding said standard internal representation for said online document into a merged file;

f) mining said merged file for text representative of said online technical document, including the steps of:

i) identifying key terms, including the steps of:

1) searching for syntactic patterns indicative of technical terms; and

2) maintaining a list of said key terms comprising said technical terms and the frequency with which said technical terms occur;

ii) searching for syntactic patterns indicative of manifestations of a domain primitive involving one of said key terms and maintaining a list of said manifestations and the frequency with which said manifestations occur;

iii) discourse analyzing each phrase in said merged file to resolve conjunctions and antecedent basis of pronouns to more accurately record said manifestations and the frequency with which said manifestations occur;

iv) analyzing said list of said manifestations to determine said manifestations that are representative of said online document on the basis of said frequency with which said manifestations occur;

v) expanding said list of key terms by searching said list of said manifestations for syntactic patterns involving additional terms not presently in said list of key terms that are adjunct to one of said manifestations; and

vi) searching said online technical document for lexico-syntactic patterns indicative of larger relations involving one of said key terms and one of said manifestations and maintaining a list of said larger relations; and

g) combining said key terms, said manifestations, and said larger relations in a domain catalog.

7. The method of claim 6, wherein said frequency with which said technical terms occur in said merged file is weighted according to said information regarding said standard internal representation for said online document.

8. The method of claim 6, wherein analyzing said list of manifestations to determine said manifestations that are representative of said online document on the basis of said frequency with which said manifestations occur is weighted according to said information regarding said standard internal representation for said online document.

9. The method of claim 6 wherein said domain primitive comprises terms, relations, or properties syntactically related to said key terms.

10. The method of claim 6 wherein combining said key terms, said manifestations, and said larger relations in a domain catalog comprises the steps of:

a) clustering said key terms for similarity of use on the basis of repeated manifestations of said manifestations of a domain primitive occurring in a similar syntactic context;

b) clustering said key terms on the basis of proximity of said key terms in said merged file with respect to other said key terms; and

c) indexing said domain catalog by said key terms such that each of said key terms is an index therein, and incorporating said manifestations and said larger relations according to said indexed key terms.

11. In a computer system having access to source documentation, a method of designing the content of a help database, comprising the steps of:

a) linguistically analyzing and annotating text of said source documentation to create a linguistically analyzed and annotated text;

b) mining said linguistically analyzed and annotated text for text representative of said source documentation, including the steps of:

i) searching for syntactic patterns indicative of key terms and maintaining a list of said key terms;

ii) searching for syntactic patterns indicative of manifestations of a primitive involving one of said key terms and maintaining a list of said manifestations; and

iii) analyzing said list of said manifestations to determine said manifestations that are representative of said source documentation;

c) combining said list of said key terms and said list of said manifestations that are representative of said source documentation in a catalog; and

d) using said catalog to create said content of said help database.

12. The method of claim 11, wherein said content comprises a file containing said list of said key terms and said list of said manifestations that are representative of said source documentation.

13. In a desktop publishing system, having access to a reference manual, a method of designing an index for said reference manual, comprising the steps of:

a) linguistically analyzing and annotating text of said reference manual to create a linguistically analyzed and annotated text;

b) mining said linguistically analyzed and annotated text for text representative of said reference manual, including the steps of:

i) searching for syntactic patterns indicative of index terms and maintaining a list of said index terms;

ii) searching for syntactic patterns indicative of manifestations of a primitive involving one of said index terms and maintaining a list of said manifestations; and

iii) analyzing said list of manifestations to determine said manifestations that are representative of said reference manual on the basis of the frequency of their occurrence;

c) combining said list of said index terms and said list of said manifestations that are representative of said reference manual in an index file; and

d) using said index file to create said index for said reference manual.

14. In a desktop publishing system, having access to a reference manual, a method of designing a glossary for said reference manual, comprising the steps of:

a) linguistically analyzing and annotating text of said reference manual to create a linguistically analyzed and annotated text;

b) mining said linguistically analyzed and annotated text for text representative of said reference manual, including the steps of:

i) searching for syntactic patterns indicative of glossary terms and maintaining a list of said glossary terms;

ii) searching for syntactic patterns indicative of manifestations of a primitive involving one of said glossary terms and maintaining a list of said manifestations; and

iii) analyzing said list of said manifestations to determine said manifestations that are representative of said reference manual on the basis of their frequency of occurrence;

c) combining said list of said glossary terms and said list of said manifestations that are representative of said reference manual in a glossary file; and

d) using said glossary file to create said glossary for said reference manual.

15. In a computer system having access to a source code document, a method for designing a library of variables and procedure calls for said source code document, comprising the steps:

a) linguistically analyzing and annotating a source code of said source code document to create a linguistically analyzed and annotated source code;

b) mining said linguistically analyzed and annotated source code for source code representative of said variables and procedure calls, including the steps of:

i) searching for syntactic patterns indicative of key terms comprising variables and procedure calls, and maintaining a list of said key terms;

ii) searching for syntactic patterns indicative of manifestations of a primitive involving one of said key terms and maintaining a list of said manifestations; and

iii) analyzing said list of said manifestations to determine said manifestations that are representative of said variables and procedure calls on the basis of frequency of their occurrence;

c) combining said list of said key terms and said list of said manifestations that are representative of said variables and procedure calls in a library file; and

d) using said library file to create said library of variables and procedure calls.

* * * * *

US005321604A

United States Patent [19]

Peach et al.

[11] Patent Number: 5,321,604

[45] Date f Patent: Jun. 14, 1994

[54] APPARATUS AND PROCESS FOR ADMINISTERING PROMOTIONAL MAILING

[75] Inventors: John A. Peach, Monticello; Paul H. Korba, Lakeland; Kenneth M. Rapp, St. Paul, all of Minn.

[73] Assignee: Fulfillment Systems Inc., Monticello, Minn.

[21] Appl. No.: 830,635

[22] Filed: Feb. 4, 1992

Related U.S. Application Data

[62] Division of Ser. No. 649,970, Feb. 4, 1991, Pat. No. 5,085,470, which is a division of Ser. No. 328,109, Mar. 23, 1989, Pat. No. 5,053,955.

[51] Int. Cl.[5] G06F 15/22; G06F 15/24; G06G 7/52

[52] U.S. Cl. 364/401; 209/3.1; 209/509; 209/900

[58] Field of Search 364/401; 209/3.1, 509, 209/900

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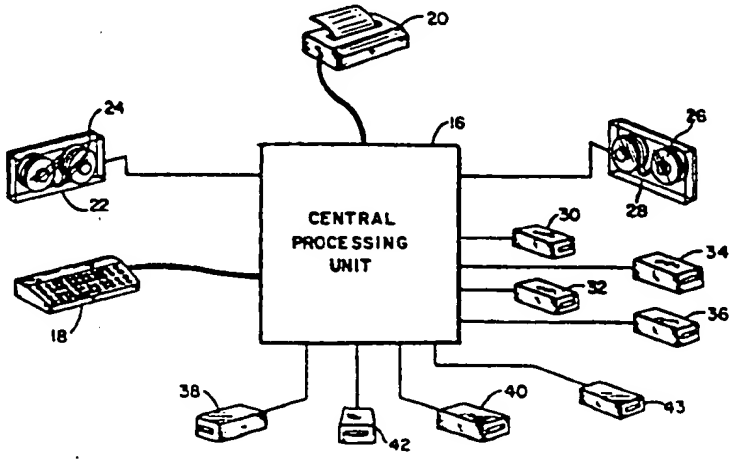
Primary Examiner—Roy N. Envall, Jr.
Assistant Examiner—Laura Brutman
Attorney, Agent, or Firm—Frederick W. Niebuhr

[57] ABSTRACT

A process is disclosed for merging promotional information, based on multiple requests and relating to different promotions, into a single stream for the printing and mailing of coupons, checks or other promotional items. The requests relating to a particular promotion are matched with an associated promotion control record, with one or more promotions similarly associated with an account control record in the, case of preparing checks. Prior to printing, individual data entries for various promotions are combined, and sorted in a sequence predetermined for qualification for various postal rate classifications, thus to minimize the cumulative cost of mailing the entries. Pertinent information associated with each entry is printed on sheets of card stock, each sheet separable into four individual segments to provide four checks or coupons. Prior to printing, the entries are re-sequenced such that eventual severing of the card stock creates stacks or bundles of mailing items arranged in the desired mailing sequence.

17 Claims, 6 Drawing Sheets



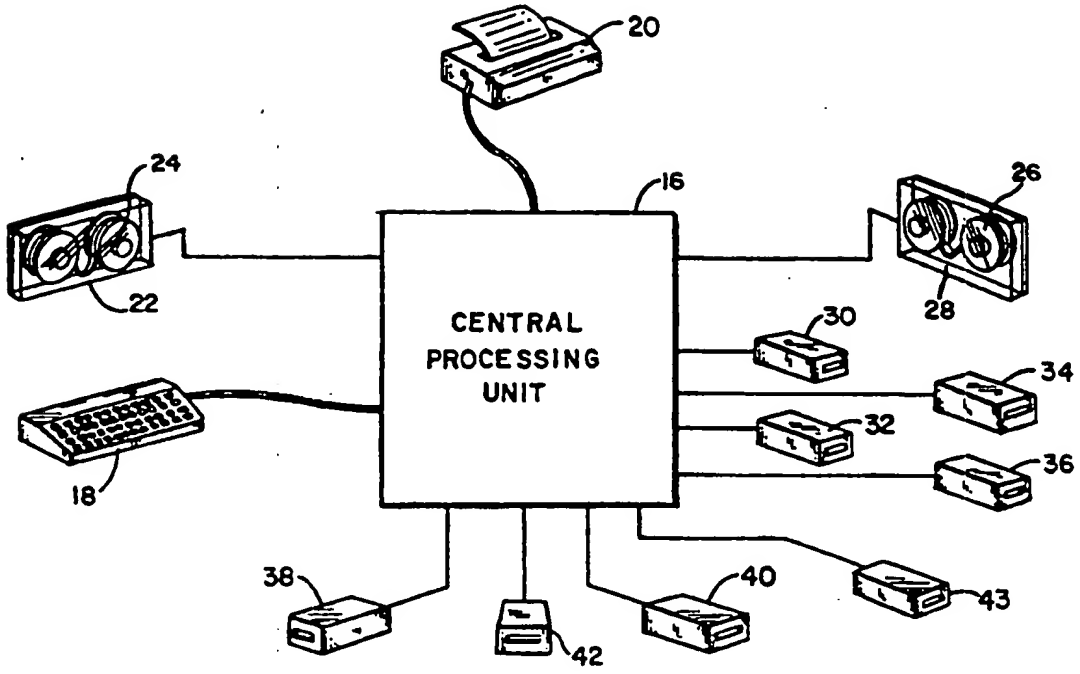

20
24
16
26
22
CENTRAL
PROCESSING
UNIT
28
30
34
32
36
18
38
40
43
42

FIG. 1

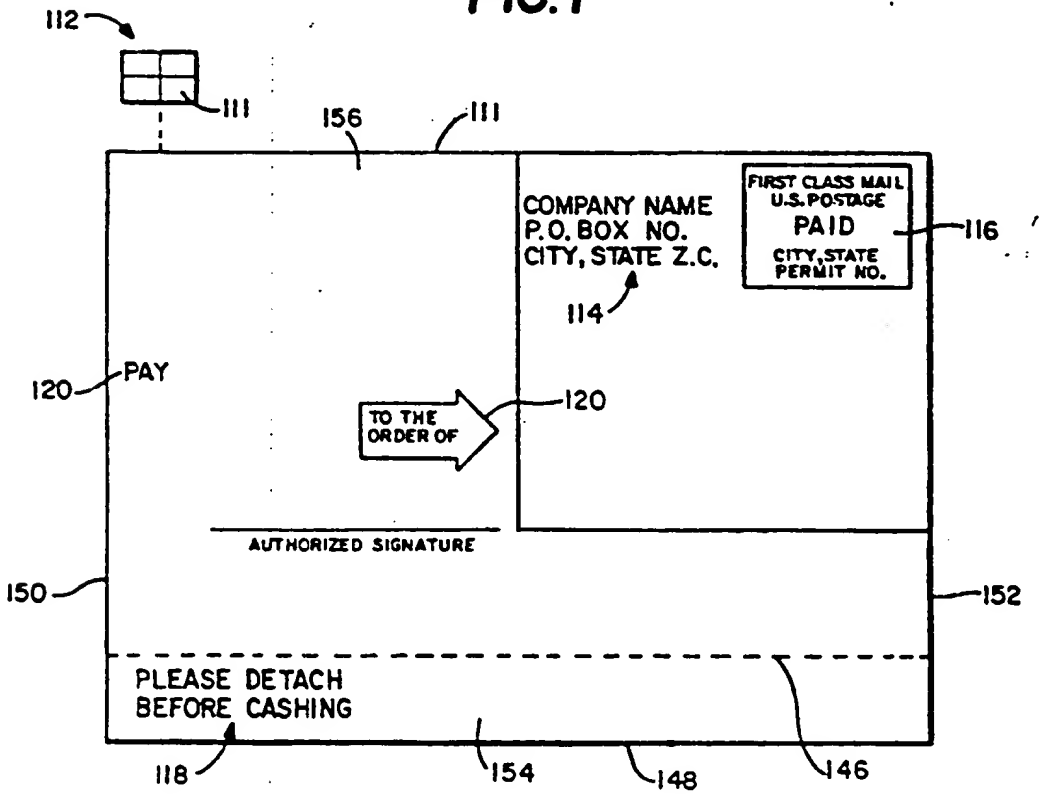

112
111
156
111
COMPANY NAME
P.O. BOX NO.
CITY, STATE Z.C.
FIRST CLASS MAIL
U.S. POSTAGE
PAID
CITY, STATE
PERMIT NO.
116
114
120
PAY
TO THE
ORDER OF
120
AUTHORIZED SIGNATURE
150
152
PLEASE DETACH
BEFORE CASHING
118
154
148
146

FIG. 5

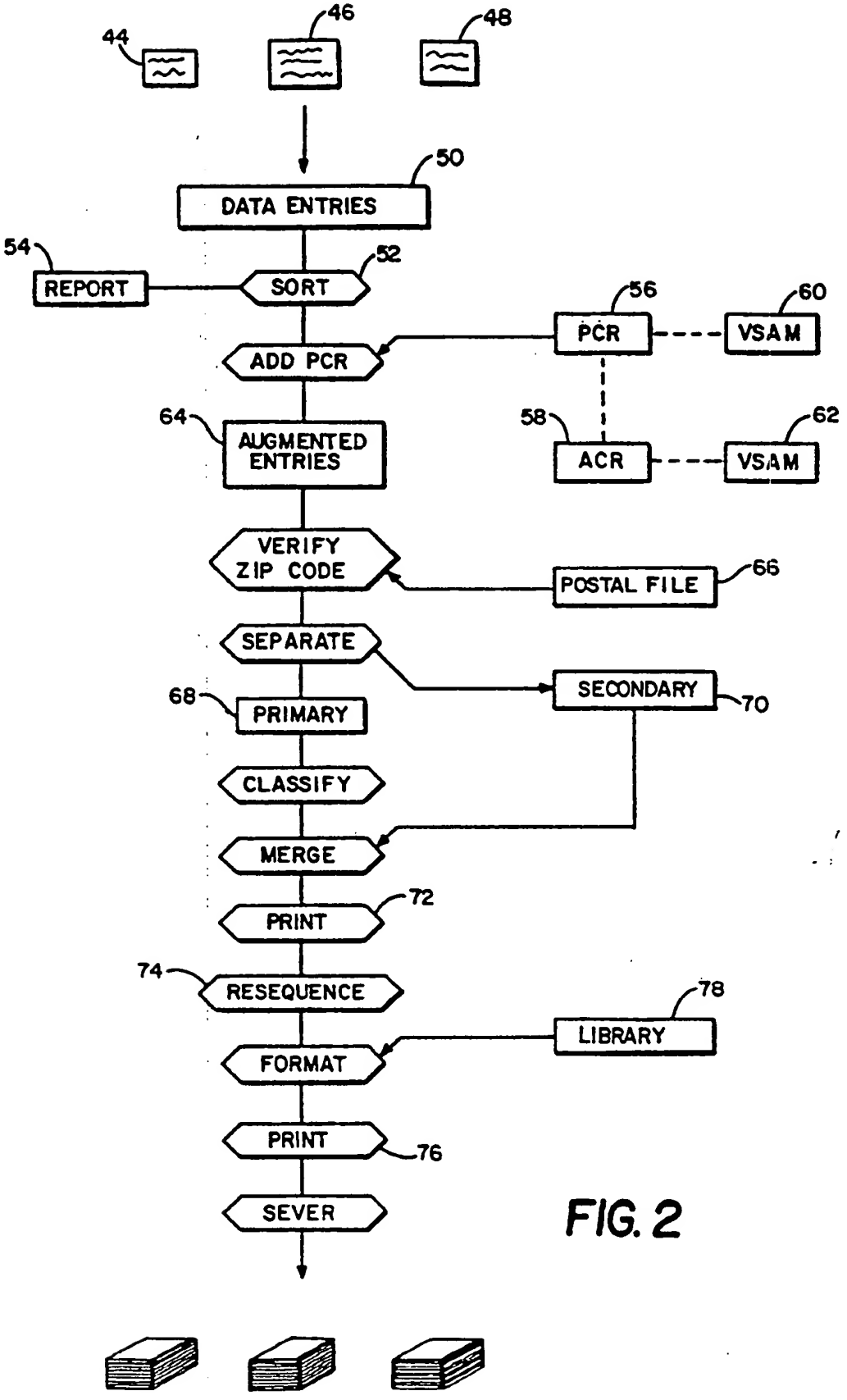

44
46
48
50
DATA ENTRIES
54
REPORT
52
SORT
56
PCR
60
VSAM
ADD PCR
64
AUGMENTED ENTRIES
58
ACR
62
VSAM
VERIFY ZIP CODE
POSTAL FILE
66
SEPARATE
SECONDARY
70
68
PRIMARY
CLASSIFY
MERGE
72
PRINT
74
RESEQUENCE
78
LIBRARY
FORMAT
PRINT
76
SEVER

FIG. 2

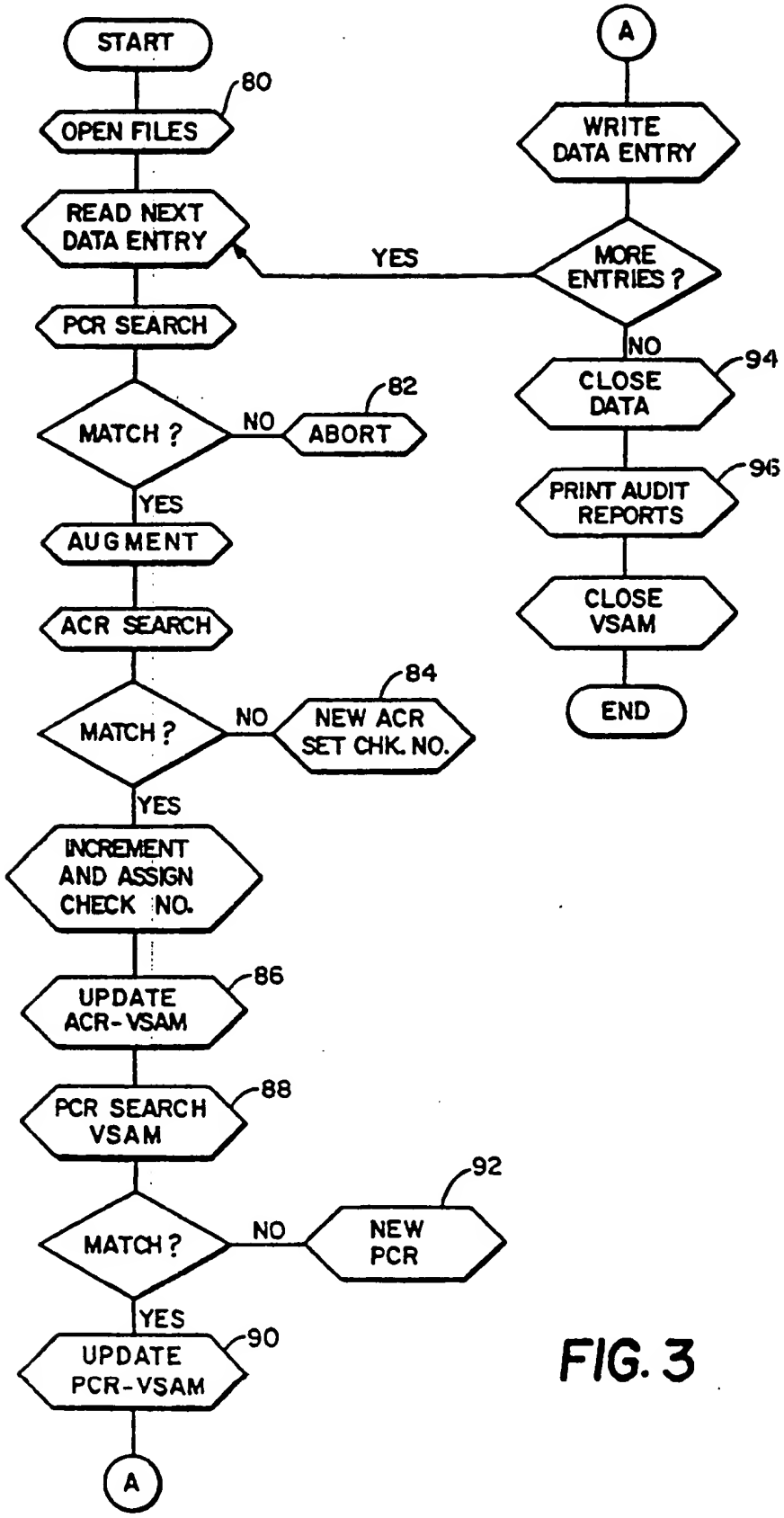

START
80
OPEN FILES
READ NEXT DATA ENTRY
PCR SEARCH
MATCH ?
NO
82
ABORT
YES
AUGMENT
ACR SEARCH
MATCH ?
NO
84
NEW ACR SET CHK. NO.
YES
INCREMENT AND ASSIGN CHECK NO.
UPDATE ACR-VSAM
86
PCR SEARCH VSAM
88
MATCH ?
NO
92
NEW PCR
YES
UPDATE PCR-VSAM
90
A
A
WRITE DATA ENTRY
MORE ENTRIES ?
YES
NO
CLOSE DATA
94
PRINT AUDIT REPORTS
96
CLOSE VSAM
END

FIG. 3

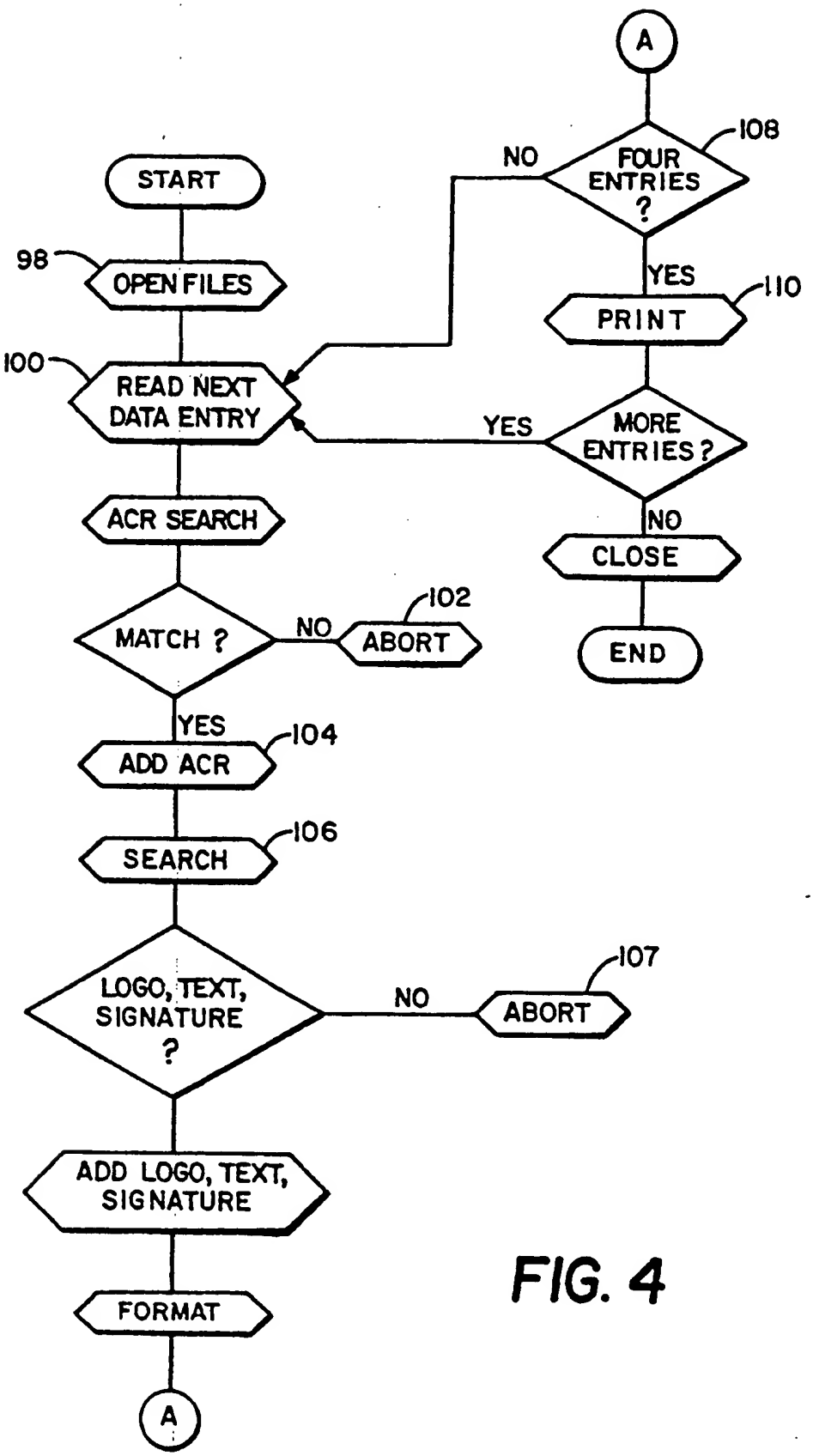

A
108
NO
FOUR ENTRIES ?
START
98
OPEN FILES
YES
110
PRINT
100
READ NEXT DATA ENTRY
YES
MORE ENTRIES ?
ACR SEARCH
NO
CLOSE
102
MATCH ?
NO
ABORT
END
YES
104
ADD ACR
106
SEARCH
107
LOGO, TEXT, SIGNATURE ?
NO
ABORT
ADD LOGO, TEXT, SIGNATURE
FORMAT
A

FIG. 4

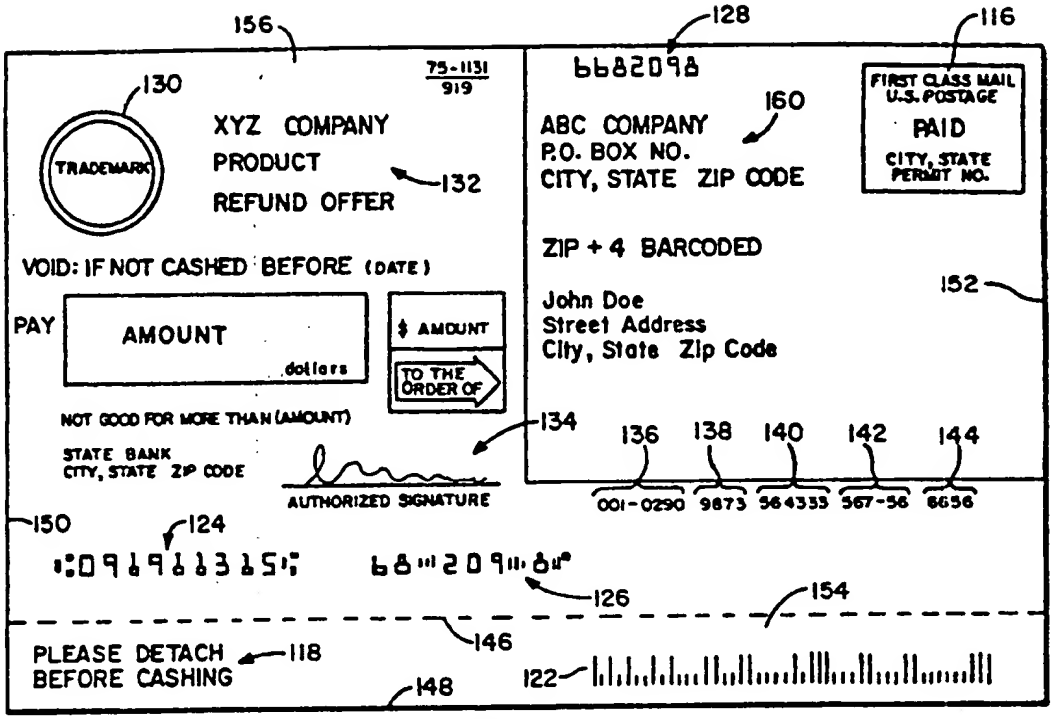

156
128
116
75-1131
919
130
668098
TRADEMARK
XYZ COMPANY
PRODUCT
REFUND OFFER
132
160
ABC COMPANY
P.O. BOX NO.
CITY, STATE ZIP CODE
FIRST CLASS MAIL
U.S. POSTAGE
PAID
CITY, STATE
PERMIT NO.
ZIP + 4 BARCODED
VOID: IF NOT CASHED BEFORE (DATE)
152
John Doe
Street Address
City, State Zip Code
PAY
AMOUNT
dollars
$ AMOUNT
TO THE ORDER OF
NOT GOOD FOR MORE THAN (AMOUNT)
134
136
138
140
142
144
STATE BANK
CITY, STATE ZIP CODE
AUTHORIZED SIGNATURE
001-0290
9873
564333
567-58
6656
150
124
126
154
146
PLEASE DETACH
BEFORE CASHING
118
122
148

FIG. 6

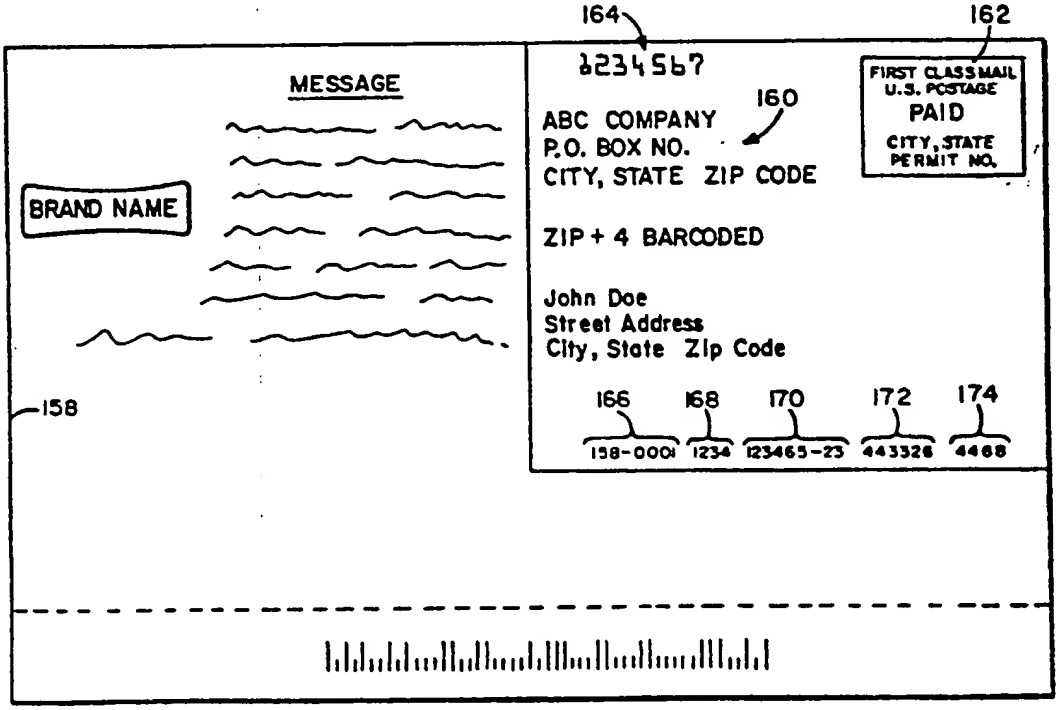

164
162
623567
MESSAGE
160
ABC COMPANY
P.O. BOX NO.
CITY, STATE ZIP CODE
FIRST CLASS MAIL
U.S. POSTAGE
PAID
CITY, STATE
PERMIT NO.
BRAND NAME
ZIP + 4 BARCODED
John Doe
Street Address
City, State Zip Code
158
166
168
170
172
174
158-0001
1234
123465-23
443328
4468

FIG. 7

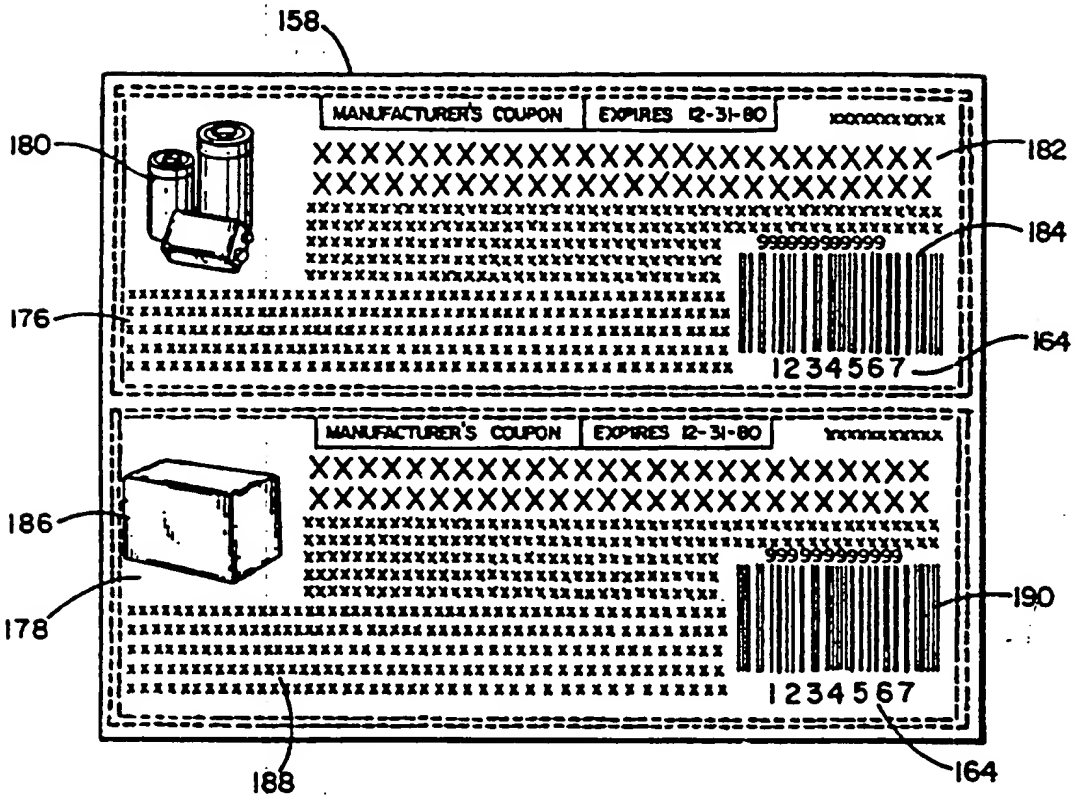

158
MANUFACTURER'S COUPON
EXPIRES 12-31-80
180
182
184
176
164
MANUFACTURER'S COUPON
EXPIRES 12-31-80
186
178
190
188
164

FIG. 8

APPARATUS AND PROCESS FOR ADMINISTERING PROMOTIONAL MAILING

This is a Divisional of copending application Ser. No. 07/649,970, filed on Feb. 4, 1991 now U.S. Pat. N . 5,025,475, which is a divisional of parent application Ser. No. 07/328,109, filed Mar. 23, 1989, now U.S. Pat. No. 5,053,955, issued Oct. 1, 1991.

BACKGROUND OF THE INVENTION

The present invention relates to processing promotional items for mailing, and more particularly to preparing checks, coupons or other items related to several different promotions and serially arranging these items to facilitate their bundling prior to mailing.

Consumer product manufacturers routinely engage in promotional activities to encourage the purchase of their products. Among these activities are mass mailings of coupons, checks or other promotional items, either to provide a discount in the form of cash returned to customers for purchasing a particular product, or to encourage purchasers of one product to try another of the manufacturer's products, for example with a discount coupon usable upon purchase of the other product.

Coupons or other documents presented in a form suitable for mailing are disclosed in U.S. Pat. No. 443,141 (Kittredge) directed to a printed pamphlet including one or more coupons and mailing address information, and U.S. Pat. No. 1,415,596 (McKinnie) directed to an advertising or coupon device that can be f lded into an envelope addressed to the customer. A related "alternative value" device is disclosed in U.S. Pat. No. 4,722,554 (Pettit), although not in a form suitable for mailing. A single sheet of paper includes a negotiable instrument on one side, and one or more coupons on the other. Use of either the coupon or the negotiable instrument invalidates the other, due to an overlapping arrangement.

The processing of promotions, i.e. providing the appropriate check or discount coupon to the customer as a reward for the initial purchase, involves high volume and labor intensive activity including collection, verification and organization of initial proofs of purchase and related information, preparation of the checks, coupons or other items using preprinted stock provided by the sponsor in connection with the particular promotion, and finally the sorting of individual items based on their mailing destinations.

At any given time, a typical provider of promotion services, is involved with many different promotions of various sponsoring manufacturers. Preprinted forms, when provided by different sponsors, can vary in size and shape, thus creating the need to handle individual promotions separately. This increases handling expense, not only in added labor, but also in the mailing cost, as it is difficult with a single promotion to accumulate a volume of items sufficient to qualify for certain reduced postage rates, e.g. the reduced rate available for mail presorted by zip code of the destination. Manual recombination and sorting of items for multiple promotions would be prohibitively expensive.

Frequently checks or coupons are mailed in envelopes, which involves further costs of material for the envelopes, printing the envelopes and inserting items into the envelopes. These further costs can be avoided by presenting checks in postcard form, as disclosed in U.S. Pat. No. 914,460 (Selden) and in U.S. Pat. No. 1,264,795 (Hill). U.S. Pat. No. 1,374,501 (Greig) discloses a postcard used to arrange a "help wanted" advertisement, with a front face f the postcard including the publisher's address and a stamp locati n, and the reverse face including the advertisement subject matter heading and space in which t write the advertisement.

As for generating coupons, U.S. Pat. No. 4,723,212 (Mindrum et al) discloses a point of sale computer system for printing redeemable coupons, responsive to sensing the purchase of certain products predesignated to trigger printing coupons for products different than the triggering product. The system includes a store controller and a group of terminals connected to the controller. Also connected to the controller are storage files relating to products, particular coupons, and a log of coupons. At least one of the terminals is connected to a printer which prints coupons in a price bar code format responsive to sensing various triggering products. Bar code information includes value, expiration date, a manufacturer's code and a product family. This information also can be printed on the coupon in human readable form.

While this system addresses certain needs in the retail point of sale environment, and the various printed forms discussed above are satisfactory in particular situations, none of these approaches satisfies the unique needs of administering promotions, particularly when multiple customers and many different promotions are involved.

Therefore, it is an object of the present invention to provide a means for processing promotions which permits a commingling of items from many different promotions into a single printing stream.

Another object is to provide an apparatus for preparing mailing items for a multiplicity of promotions, utilizing a postcard format of uniform shape and size.

Another object is to provide a means for sorting multiple promotional items from different promotions into a series of bundles or groups for convenient, low cost mailing.

Another object is to provide apparatus for printing pluralities of checks, coupons or other promotional items on single sheets of printing stock, in a predetermined printing sequence such that separation of stacks of printing stock into separate stacks of promotion items, subsequent to printing, forms bundles or stacks of such items arranged to minimize the cost of postage.

Another object is to provide a system for fulfilling customer requests based on a multiplicity of different promotions simultaneously, with means for conveniently auditing the progress of individual promotions.

Yet another object of the invention is to provide a postcard check document printed in a magnetic ink, in which a customer mailing address zip code is printed in a U.S. postal service standard bar code form, and in which certain information pertinent to negotiating the check is printed in a standard magnetically readable character font, with the postal bar code conveniently removable prior to negotiating the check.

SUMMARY OF THE INVENTION

To achieve these and other objects, there is provided a process for preparing multiple individual promotional mailing items based on a plurality of promotions, in a form to reduce the cost of mailing to multiple destinations, including the following steps:

a. storing a plurality of promotion entries, each uniquely associated with one of a plurality of promotions, in a first bit-encoded data storage means, each of

the promotion entries including a unique promotion flag and a promotion legend identifier unique to the associated promotion;

b. loading multiple data entries into a sec nd bit-encoded data storage means, each data entry including a mailing address and one of the promotion flags;

c. matching the promotion flags to operatively associate the first data storage means and the second data storage means, and adding each of the promotion entries to each of its associated data entries, to form multiple combined entries, and storing the combined entries in a third bit-encoded data storage means;

d. sorting the combined entries into sets and subsets independently of the promotion flags, with each of the sets corresponding to one of a plurality of different postal mailing rate classifications, and with each of the subsets corresponding to one of a plurality of different designated postal delivery areas based upon the mailing addresses;

e. arranging the sets and subsets in a predetermined sequence of the combined entries;

f. generating a plurality of entry images, one image associated with each of the combined entries, wherein each one of the images includes its associated address and a promotion legend corresponding to said identifier; and

g. printing the entry images individually upon pieces of printing stock and in a printing sequence dependent upon the predetermined sequence, thereby to form individual printed mailing items, with the mailing items serially arranged to facilitate their grouping into bundles corresponding to the subsets of combined entries.

Preferably, the process further includes storing multiple mailing location indicia and their corresponding postal zip codes in yet another bit-encoded data storage means, and operatively associating it with the third data storage means to either confirm the accuracy of the zip code, correct an erroneous or incomplete zip code, or add a zip code.

When mailing items include secondary items prepared for mailing to foreign destinations, or for other reasons not subject to zip code processing, the process includes separating such secondary items prior to performing the above operations on the remaining or primary items. After the operations are performed, the primary and secondary items are re-associated.

In a preferred embodiment, the printing stock includes stacks of sheets, each sheet being severable into four individual and identically sized segments corresponding to the individual mailing items. In this event, the printing step involves selectively reordering the predetermined sequence to provide the printing sequence. Consequently, severing stacks of sheets after printing arranges stacks of the individual segments into the appropriate bundles of mailing items, grouped for minimal cost mailing.

An alternative form of the present invention is a process for printing multiple checks and arranging the checks in a predetermined sequence to facilitate low cost mailing to multiple destinations. This process includes the steps of:

a. loading multiple data entries into a first bit-encoded data storage means, each data entry including a payee name, a payee mailing address, a check amount, and one of a plurality of account flags, each account flag uniquely identifying a checking account maintained in a drawee financial institution;

b. storing a plurality f account entries in a second bit-encoded data storage means, each account entry including one of the account flags, a checking account number and drawee information identifying the associated drawee;

c. sorting the data entries int sets and subsets independently of the account flags, with each of the sets corresponding to one of a plurality of different postal mailing rate classifications, and with each of the subsets corresponding to one of a plurality of different designated postal delivery areas based upon the payee mailing addresses, and arranging the sets and subsets in a predetermined sequence of the data entries;

d. assigning a check number to each of the account entries, matching the account flags to operatively associate the first data storage means and the second data storage means, to add each of the account entries to each of its associated data entries, and incrementing the check number each time the associated checking account is matched with one of the data entries;

e. generating a plurality of entry images, one image associated with each of the data entries, each of the images including its associated payee name, payee mailing address, check amount, check number, account number and drawee information; and

f. printing the entry images individually upon pieces of printing stock and in a printing sequence dependent upon the predetermined sequence, thereby to form individual printed checks, serially arranged to facilitate their grouping into bundles of checks corresponding to the subsets of entries.

Preferably, each check is in a post card format, with an edge strip severable from the remainder of the check. The postal zip code, printed in magnetic bar form with a magnetic ink, is then located on the edge strip, while the check number, account number and certain information designating the drawee financial institution is printed on the remainder, again in a magnetic ink and in a standard magnetic character font. Accordingly, the check when mailed can qualify for the lowest cost "bar code" mailing rate. The edge strip is torn away before negotiation of the check, so that the postal bar code no longer is present to interfere with an accurate magnetic reading of the check and drawee information.

In practice, the multiple requests for fulfillment of many promotions can be organized initially by promotion, for example on magnetic tape reels, one reel associated with each promotion. Promotion control records for multiple promotions can be stored on a magnetic disc, and in the case of checks, account control records covering a plurality of checking accounts are stored on one or more magnetic discs. A controller, for example a digital computer, matches the data on the magnetic tapes and discs according to shared promotion numbers and account numbers, thus to provide combined or up-dated individual entry records.

The individual records further are merged with a record of nine-digit postal zip codes, stored for example on a magnetic disc, to confirm, correct or provide the nine digit zip code appropriate to each combined entry. Then, the entries from all involved promotions are sorted, independently of the promotions, into sets according to applicable postage rates, and subsets according to postal delivery areas based on the zip codes.

A final sorting operation takes into account the printing of four checks (or coupons) on each sheet of printing stock. Because of this final sorting, stacks of sheets, when severed after printing, provide individual stacks

of checks or coupons presorted into the appropriate subsets for minimum postage.

Thus, in accordance with the present invention, large amounts f data for different promotions and multiple individual entries are processed rapidly and efficiently, with checks and coupons generated in sufficient volume to qualify for discounted postage, even though individual promotions may include only a single check or coupon. The use of a uniform size and shape of sheet stock for all promotional items eliminates the problem of excess custom stock. An individualized or custom appearance is achieved by storing textual information and digitized logotypes of the sponsor of each promotion. Thus, the cost savings of uniform stock are achieved without sacrificing the sponsor's desire to distinguish its promotions from programs of other sponsors.

IN THE DRAWINGS

For a further understanding of the above and other features and advantages, reference is made to the following detailed description and the drawings, in which:

FIG. 1 is a diagrammatical view of apparatus used in performing a process for preparing multiple individual promotional checks or coupons, in accordance with the present invention;

FIG. 2 is a schematic representation of the process;

FIG. 3 is a flow chart illustrating part of the process;

FIG. 4 is a flow chart illustrating another part of the process;

FIG. 5 is a top plan view of a negotiable instrument form suited for use in the process;

FIG. 6 is a top plan view of a negotiable instrument prepared from the form according to the process;

FIG. 7 is a top plan view of a discount coupon prepared according to the process; and

FIG. 8 is a bottom plan view of the discount coupon of FIG. 7.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning now to the drawings, there is shown in FIG. 1 a system for preparing promotional checks, discount coupons or other promotional items in a sequence to facilitate their assembly into bundles of mailing items, each associated with a designated postal delivery area. Ordinarily, companies sponsoring promotions do not perform these activities directly, but rather through a provider of these services. Accordingly, the provider is likely to serve a wide variety of sponsors or clients, and at any given time may be involved in hundreds of different promotions with hundreds of thousands of individual items to prepare and mail.

The system in FIG. 1, therefore, is preferably configured to process high volumes of items and corresponding data. At the heart of the system is a central processing unit (CPU) 16, for example an IBM Model 4381 main frame computer, operated through a keyboard 18 or other suitable data entry means. Discount coupons or checks are generated with a printing system 20 operatively connected to the processing unit. A preferred printing system is a Xerox Model 8790 electronic printer, which provides hot-fusion laser printing with a dry magnetic ink to enable magnetic reading of information printed on the promotional items.

A number of peripheral devices are operatively connected processing unit 16, including a magnetic tape drive 22 and an input magnetic tape reel 24 for storing customer entries in bit-encoded form. An output magnetic tape reel 26 and a magnetic tape drive 28 are provided for st ring updated customer data entries, each corresponding t one of the original entries stored on tape reel 24.

A plurality f disc drives are associated with central processing unit 16, including a disc drive 30 for storing promotion control records, a disc drive 32 for storing account control records, and disc drives 34 and 36 housing VSAM (virtual storage assembly method) cumulative statistics relating to the production control records and account control records, respectively. A disc drive 38 contains a plurality of operation programs for sorting entries and for assigning and incrementing check numbers, and a disc drive 40 contains mailing area and zip code information. A disc drive 42 contains custom textual material and logotypes in digital form and relating to individual promotions and sponsors, along with a file of authorized signatures for various checking accounts of individual sponsors. Finally, a disc drive 43 contains further customer textual material and logotypes in digital form, again relating to individual promotions and sponsors. The information stored in disc drive 43 is used only in connection with coupons, for printing the reverse side of each mailing item.

With reference to FIG. 2, the system of FIG. 1 is employed after receiving multiple requests for promotional items and performing preliminary manual operations. These include prescreening entries to verify purchases, e.g. by a proof of purchase seal, eliminating duplicates, and sorting entries into batches as at 44, 46 and 48. Each batch is associated with only one of the promotions involved, while a single promotion may include more than one batch.

Each original data entry 50 includes the name and mailing address of a customer destined to receive the check or coupon, the value (e.g. amount of the check or discount) of the item, and the following identifying numbers: a promotion number or flag, a mail lot number, a batch number and an order number. The promotion flag uniquely identifies the sponsor and the particular promotion. The mail lot number identifies a particular group of batches. The order number uniquely identifies each data entry. The system is used initially by loading multiple data entries on tape reel 24, using keyboard 18 or other suitable data entry device operatively connected to tape drive 22.

If desired, customer requests entered into the system by tape reel 24 may be sorted according to promotion flags as indicated at 52, for generating reports 54 useful in verifying information prior to further processing, e.g. by client, by promotion, or by value of the check or discount coupon.

Also, prior to further processing, files of bit-encoded data are created for adding data to each data entry 50. These include promotion control records 56 stored on disc 30, and account control records 58 stored on disc drive 32. A single promotion control record, in virtual "card image" form, is associated with each of the promotions involved. Each promotion control record includes its associated promotion flag or identification number, and a single bank account number or flag which uniquely identifies a checking account upon which the check is drawn. Further, the promotion control record includes a logo identifying number associated with one of the digitized logotypes stored on disc drive 42, and a text identification number associated with a message of the promotion sponsor.

Each account control record 58 is associated with a particular checking account, which may cover more than one promotion. Each account control record includes its identifying account flag, the name and address of the bank or other drawee financial institution where the checking account is maintained, a check number to be incremented during processing, a signature number identifying an associated authorized signature stored on disc drive 42, and other information identifying the institution, such as the ABA routing and transit numbers.

As indicated at 60 and 62 respectively, records 56 and 58 are associated with VSAM files for maintaining cumulative statistics. In particular, file 60 accumulates check or coupon quantities and amounts organized by promotion, while file 62 accumulates quantities and amounts by checking account, and assigns and tracks check numbers in sequence in each of the involved checking accounts.

The respective production control records and account control records are created by entering appropriate information onto their associated disc drives using keyboard 18 or other suitable entry devices. After creation of these files, CPU 16 matches promotion flags to associate individual promotion control records 56 with selected data entries 50 to provide augmented entries 64 as is further explained below in connection with FIG. 3. At the same time, each data entry which corresponds to a promotional check in the making is assigned a check number. The check number, stored in VSAM file 62 with the associated checking account, is then incremented.

The augmented data entries are matched with a postal file 66 stored on disc drive 40 based on the mailing address, in order to verify the accuracy of a postal zip code, if any, stored as part of the mailing address in the original data entry. Based upon a comparison, the zip code is either confirmed or corrected. A zip code is added if none was present. This operation is performed with purchased application programs, for example programs entitled "EZ5" and "M5$$" available from Group One Software of Washington, D.C.

These application programs further are used to separate the augmented data entries into primary entries 68 for further sorting based on the postal zip code, and secondary entries 70 not subject to zip code sorting. The secondary entries have addresses outside of the United States, or are designated for special inspection, usually in connection with the first occurrence of a promotion. The primary data entries then are sorted according to various available postage classifications, again with the application programs. More particularly, the primary entries are divided into three mailing classifications: a bar code qualified class, a presort qualified class, and a residual class. The bar code qualified class includes only mailing items preprinted with a magnetically readable bar code representation of the nine digit zip code, and qualifies for the lowest rate of the three classes. Presort qualified mail is given a reduced postage based on prior sorting based on the zip code.

Each of the three sets of postal rate classifications is further divided into subsets corresponding to postal delivery areas. Finally, the postal application programs are used in predetermining the required number of packages and trays, according to U.S. Postal Service regulations, needed to accommodate the records when organized into these sets and subsets. For example, a typical run may involve from one hundred thousand to one hundred fifty thousand individual entries, with about eighty percent of these entries in the bar code qualified class, with the majority of the remaining twenty percent in the presort qualified class. It should be noted that this predetermination and presorting operation is conducted with the objective of minimum total or cumulative cost of mailing the items. Thus, certain items may be classified as presort, even though printed with the postal bar code.

Following the predetermination of the optimal mailing arrangement for the primary entries, the primary and secondary entries are merged. Thus recombined, the primary and secondary data entries are assigned consecutive run sequence numbers, beginning with the first subset of the bar code qualified class, and ending with the final subset of non-sorted or secondary data entries. The data entries in each subset are numbered consecutively, and all of the subsets within a set are assigned a run sequence number before proceeding to the next set, e.g. to number n entries in accordance with the following table:

Group	Assigned Run Sequence Numbers
Bar code qualified	1 through a
Presort qualified	(a + 1) through b
Residual	(b + 1) through c
Secondary entries	(c + 1) through n

Thus is formed a predetermined sequence of all entries, consecutively numbered from 0 though n in a predetermined optimal mailing sequence which ultimately determines the loading of labeled boxes of the items to be mailed.

After the run sequence numbers have been assigned, printer 20 is caused to print a plurality of box labels at 72, each label identifying the postal rate and classification (set), the postal delivery area (subset) identified by a zip code or grouping of zip codes, and a beginning and ending run sequence number. Each label thus corresponds to one of the subsets of primary and secondary entries, and is designated for eventual affixation to a box containing a stack of checks or other mailing items corresponding to one of the subsets. The labels corresponding to the secondary data entries identify the postal rate and class, and the first and final run sequence numbers.

In the presently preferred embodiment, checks, coupons or other promotional items are prepared by printing the desired information upon sheets of card stock arranged in stacks, with each individual sheet severable into four individual promotional mailing items. Accordingly, an obverse face of each single sheet is printed with the appropriate information of four data entries such that severance of the sheet subsequent to printing forms the corresponding four mailing items.

In view of this approach, the data entries must be resequenced as indicated at 74, prior to printing, in order to ensure that the eventual separation of stacks of printed card stock into the individual mailing items forms stacks of individual mailing items that replicate the predetermined optimum mailing sequence, i.e. the aforementioned organization into sets and subsets. In the present embodiment, sheets of card stock are arranged in stacks of fifteen hundred, for eventual separation into four stacks of checks, coupons or other items. Consequently an optimal printing sequence is gener-

ated, depending upon the optimal run sequence, in accordance with the following table:

Run Sequence Number	Printing Sequence
0001	0001
0002	1501
0003	3001
0004	4501
0005	0002
0006	1502
0007	3002
0008	4502
.	.
.	.
.	.
5995	4499
5996	5999
5997	1500
5998	3000
5999	4500
6000	6000

The printing operation 76 can begin as soon as the data entries are organized according to the optimal printing sequence. Then, in accordance with the printing sequence, each data entry is read and its associated information formatted to create an entry image to be printed. In connection with checks, the reading of each data record is followed by using the account flag to match the data entry with its appropriate checking account, and the information appropriate to the checking account is formatted along with the remaining information as part of the image to be printed. As further explained in connection with FIG. 4, the forming of the entry images also involves retrieving promotion legends including the appropriate logotypes and textual material, and authorized signatures from library files 78 on disc 42.

Each time four entry images are formatted, these images are printed upon the obverse face of one of the sheets of card stock whereupon the printed sheet is removed and the next sheet presented for printing, all while the next four consecutive entry images are being formatted These steps are repeated until the printing sequence is complete.

Following printing, stacks of the printed sheet stock are severed into individual stacks of checks, coupons or the like. As a result of the optimal printing sequence, such individual stacks of items correspond to the previously discussed subsets and can be directly loaded into boxes labeled with the printed labels prepared at step 72. The printing and sorting operations leading to printing are completely independent of the promotion, and thus mailing items from many different promotions are commingled in each individual box. This of course is immaterial to the determination of various postal rates, and the organization of mailing items to qualify for various postal rates. Nonetheless, the concern of each sponsor, that its identity and its promotions are clearly distinguishable from the identity and promotions of other sponsors, is satisfied in that each entry image is created based upon its associated promotion control record and account control record. Each check or coupon, although commingled with items from many other sponsors, clearly identifies its associated sponsor and promotion.

FIG. 3 is a flow chart illustrating the updating or augmenting of data entries. As indicated at 80, the process is initiated by opening the files of data entries 50, promotion control records 56, account records 58, and the associated VSAM files 60 and 62, in particular by CPU 16 gaining access to tape reel 24 and disc drives 30, 32, 34 and 36. An individual data entry is read, and a search conducted for a matching promotion flag among promotion control records 56. If no match is found, the program is aborted as indicated at 82. However, when a match is found, information from the appropriate promotion control record is added to the data entry to provide the augmented or updated entry 64.

Next, the augmented data record is matched with account control records 58 in search of a matching account flag. If none is found, a new account record is created, and its corresponding check number set at 000001, or other appropriate predetermined initial number, as indicated at 84. On the other hand, if a match is found, the check number existing in the corresponding account control record 58 is incremented by 1. In either event, the check number is added to the augmented data entry. The associated cumulative record on VSAM file 62 is updated at 86 as to the check quantity and cumulative dollar amount.

Next, VSAM file 60 corresponding to the promotion control records is searched for a matching promotion flag, as indicated at 88. Upon finding a match, VSAM file 60 is updated in connection with the associated promotion, as to the quantity (number of individual entries) and cumulative amount. Conversely, if no match has been found, a new promotion record is created as at 92 in PCR file 56, corresponding to the promotion, which is an indication that the particular promotion is appearing for the first time in the run.

At this stage, information relating to the augmented data entry 64 is entered on tape reel 26 for permanent storage.

After entry of the augmented record, the next original data entry 50 is read and the above-described steps are repeated. After the final original data entry has been processed and the absence of further original entry is confirmed, the data entry file is closed at 94, the ending check number for each checking account is stored in connection with its account in account control records 58. At 96, the files containing promotion control records 56, account control records 58 and their associated VSAM files are read and audit reports printed. After the printing of audit reports, these files are closed, ending the augmenting process. At the conclusion of augmenting, tape reel 26 includes an augmented data entry 64 corresponding to each original data entry 50 on tape reel 24, with each augmented entry including the original information, along with the appropriate bank account number if the mailing item is a check, a logotype identifying flag, and a flag identifying textual material of the sponsor for the particular promotion. Further, each account control record is updated with the current check number, and the associated VSAM files are updated as to quantity and amount.

As seen in FIG. 4, the printing process begins at 98 with the opening of the augmented data entry files 64, the account control records 58 and library files 78, in particular through central processing unit 16 gaining access to tape reel 26 and tape drive 28, and disc drives 32 and 42. Augmented data entries 64 are read as indicated at 100, in the order corresponding to the optimal printing sequence. Account control records 58 are then searched for a matching account number, and if no match is found the process is aborted at 102.

Otherwise, the data entry is augmented with the account information at 104 and searched at 106 for the

presence of a logotype identifying flag, a text identifying flag and an authorized signature identifying flag. If these identifiers are located, the identified log type, text and authorized signature are combined with the augmented data entry and previously associated account control record, for a combined formatting of the information contained in the augmented data entry, the bank account number, bank name, address, routing symbol and transit number from the account control record, and the logotype, textual material and signature from the library file. If the identifiers are not located, the process aborts as indicated at 107.

Following formatting, a count is taken at 108 to determine whether four data entries and associated information have been formatted. If not, the next data entry is read and the process is repeated. Upon the formatting of four entries, the information for the entries is printed on the card stock sheets as indicated at 110. The process proceeds until all of the augmented data entries have been read, processed, formatted and printed, whereupon the files are closed and the process terminated.

The present system can process either checks or coupons as the mailing items. When the mailing items are coupons as opposed to checks, they are handled in a separate run according to a process including steps different from those represented in FIGS. 3 and 4. For example, steps relating to the account control records such as ACR search, update ACR-VSAM and adding ACR information, are unnecessary. On the other hand, the preparation of coupon mailing items involves incrementing coupons with a coupon number corresponding to the check number in the case of checks, and further involves an additional printing step in connection with the obverse surface printing described in connection with FIG. 4. More particularly, after the obverse side of each item is printed, the reverse sides of the card stock sheets are presented for printing, in accordance with the information stored in disc drive 43. Access to the corresponding reverse side information is achieved by matching promotion control flags, in essentially the same manner as gaining access to the account control records when preparing checks.

FIG. 5 shows one segment or card 111 of a sheet 112 of post card stock used in the present system to generate post card checks. As previously mentioned, each sheet eventually is severed into four checks or other mailing items, with one of four equally sized segments corresponding to each item.

Before processing in accordance with the present invention, sheet 112 may be entirely blank, but preferably is preprinted with certain information common to all sponsors and promotions involved, for example an identification of the provider of the promotion processing services at 114, indication of prepaid postage at 116, tear-away instructions at 118, and information common to all checks as at 120.

Card 111 is shown in FIG. 6, after the printing of additional information corresponding to the customer, promotion, sponsor and checking account. Preferably, all of the additional information is printed in a single step with a magnetically readable ink, thus to enable use of a bar code representation of the nine-digit postal zip code as indicated at 122, and a standard magnetically readable character font to print banking information as indicated at 124 and 126. More particularly, the bank route and transit numbers are printed at 124, with the last six digits of a seven-digit check number written at 126. The full check number is printed near the top of the sheet segment at 128.

The check number, the customer name and address, including the zip code, and the check amount all are based on information contained in the augmented data entry 64, with the zip code inf rmation having been confirmed, corrected or added using the application programs as previously noted. The checking account number, bank name and address, and route and transit numbers are provided according to the associated account control record 58. Finally, a design logotype 130, custom text 132 and authorized signature 134 are printed according to library file 78, with the appropriate entries in each case having been identified by the logotype, text and authorized signature identifiers originally in the associated promotion control record and account control record.

Finally, a series of numbers is printed on the check, including the promotion flag 136, the batch number 138, the order number 140 which is unique to the individual receiving the check, the mail lot number 142, and finally the run sequence number 144. These numbers facilitate a monitoring of the check preparation and printing process, in that the promotion flag identifies the sponsor and the particular promotion of that sponsor, for a convenient comparison and confirmation that the appropriate design logotype and textual information have been printed. The run sequence numbers confirm that stacks of checks have been presorted and printed in the proper order. Run sequence numbers at the top and bottom of each stack of checks can confirm correspondence to a particular subset of entries, and can be used to reassemble stacks of checks, should they become separated unintentionally, for example through accident or careless handling.

In each sheet segment used as a check, a series of perforations 146 is provided proximate and parallel to a bottom edge 148 of card or sheet segment 111, and runs from one side edge 150 to an opposite side edge 152. The perforations divide card 111 into a tear-away edge strip 154 and a remainder 156. The postal bar code 122 is printed on tear-away strip 154, while the banking and checking account information, particularly the information represented in a magnetic ink character font at 124 and 126, is printed on remainder 156.

Card 111 is designed as a combination postal card and check, with separate mailing and negotiation configurations. More particularly, the card is designed for mailing with strip 154 and remainder 156 attached, to enable a magnetic reading of the nine-digit zip code by postal service equipment. The customer receiving the card, however, is instructed to fold the card along perforations 146 and tear, to remove strip 154 prior to depositing or otherwise negotiating the check. This removes bar code representation 122 from the check, to eliminate any possibility of the bar code representation interfering with an accurate reading of the magnetically readable character font area conveying the banking and checking account information.

The preparation of coupons is essentially similar to the preparation of checks, with the sorting and printing processes simplified due to the absence of checking account and financial institution information, but with the added printing and formatting steps relating to the reverse side of each sheet of card stock. FIG. 7 illustrates a segment of a sheet 158 of the same card stock used in printing checks, with certain information preprinted if desired, such as the promotion processing

entity at 160 and postage paid information at 162. Again, all additional information for the obverse side is provided in a single printing step utilizing magnetically readable ink. In the case of coupons, the added information is based totally on the augmented data entries, i.e. the original data entries as updated with information from the appropriate promotion control records, and with the zip code provided or confirmed from the postal record file. A coupon number 164 is printed near the top of the card in lieu of a check number. A stream of numbers again includes the promotion number at 166, the batch number at 168, the order number 170, mail lot number 172, and run sequence number 174.

The reverse side of sheet 158 is shown in FIG. 8 and includes images for two coupons 176 and 178, respectively. Printed on coupon 176 is a logotype 80, textual material at 182 which can be printed in a variety of different sizes if desired, and a universal product code (UPC) symbol 184. Likewise, a logotype 186, text 188 and UPC symbol 190 are printed as part of coupon 178. Both coupons have the same coupon number at 164, as both coupons are part of the same mailing item. Finally, an expiration date is printed near the top of each coupon.

As noted previously, the information for the reverse side printing of sheet 158 is stored as a separate library on disc drive 43. Accordingly, logotypes 180 and 186 can be different from one another if desired, and different from the logotype appearing on the obverse side of the sheet. Similarly, UPC codes 184 and 190, which are magnetically readable, can be identical or different.

Thus, in accordance with the present invention, information relating to multiple individual requests, made in connection with numerous promotions, is merged into a single printing stream, in a sequence predetermined for an optimally low-cost mailing, and further predetermined such that severance of printed stock, into separate stacks of items for mailing, arranges the separate stacks of items according to the predetermined sequence. A convenient, uniform postal card format minimizes handling and mailing expense, yet ensures that each promotion and sponsor is identified by custom textual material and logotype. Finally, the card format is uniquely well suited for carrying postal zip code information, UPC information and checking account information in magnetically readable form.

What is claimed is:

1. A computer implemented process for preparing multiple individual promotional mailing items based on a plurality of promotions, for mailing to multiple destinations in a manner selected to facilitate mailing the items at a reduced cost, including the steps of:

screening multiple data entries to eliminate any duplicates of the entries;

storing a plurality of promotion entries, each uniquely associated with one of a plurality of promotions, in a first bit-encoded data storage means, each of said promotion entries including a unique promotion flag and a promotion legend identifier unique to the associated promotion;

loading the multiple screened data entries into a second bit-encoded data storage means, each screened data entry including a mailing address and one of said promotion flags;

matching the promotion flags to operatively associate said first data storage means and said second data storage means, and adding each of said promotion entries to each of its associated screened data entries, to form multiple combined entries;

sorting said combined entries into sets and subsets independently of said promotion flags, with each of said sets corresponding to one of a plurality of different postal mailing rate classifications, and with each of said subsets corresponding to one of a plurality of different designated postal delivery areas based upon said mailing addresses;

arranging said sets and subsets in a predetermined sequence of said combined entries;

generating a plurality of entry images, one image associated with each of said combined entries, wherein each one of said image includes its associated address and promotion legend; and

printing said entry images individually upon pieces of printing stock and in a printing sequence depending upon said predetermined sequence, thereby to form individual printed mailing items, with said mailing items serially arranged to facilitate their grouping into bundles corresponding to said subsets of combined entries.

2. The process of claim 1 including the further steps of:

storing multiple mailing location indicia and their corresponding postal zip codes in a third bit-encoded data storage means; and

operatively associating said third data storage means with said combined entries to perform one of the following operations upon each of said combined entries: confirming the accuracy of a zip code contained in the entry, correcting an erroneous or incomplete zip code in the entry, and adding a zip code to the entry.

3. The process of claim 2 including the further steps of:

before operatively associating said combined entries and third data storage means, separating said combined entries into primary entries for zip code processing and secondary entries not subject to zip code processing;

performing said operations only upon said primary data entries; and

following said operations, re-associating said primary and secondary entries.

4. The process of claim 1 wherein:

said pieces of printing stock comprise sheets arranged in stacks, each sheet being severable into a selected number of parts corresponding to said individual mailing items; and

said printing step includes selectively reordering said predetermined sequence of said combined entries to provide said printing sequence such that a severing of stacks of said sheets into stacks of said parts, following printing, forms said bundles of mailing items.

5. The process of claim 1, including the further step of:

prior to said step of loading the multiple screened data entries, sorting the data entries into a plurality of batches, with all of the data entries in each batch being associated with the same one of said plurality of promotions.

6. The process of claim 1 wherein:

each of said entry images includes obverse side information and reverse side information;

each of said pieces of the printing stock has an obverse side and a reverse side; and

said step of printing said entry images includes printing the obverse information of each entry image n the obverse side of its associated piece of the printing stock, and the reverse side information on the reverse side of said associated piece f the printing stock.

7. An apparatus for preparing multiple individual promotional items involving a plurality of promotions, for mailing to multiple destinations in a sequence selected to reduce the cost of such mailing, including:

a first bit-encoded data storage means for storing a plurality of promotion entries, each promotion entry including a promotion flag and a promotion legend unique to one of said promotions;

a second bit-encoded data storage means for storing multiple data entries, each data entry including a mailing address and one of said promotion flags;

a control means for matching the promotion flags to operatively associate said first data storage means and said second data storage means, thereby to add each of said promotion entries to each of its associated data entries, thus to form multiple combined entries;

a third bit-encoded data storage means for storing said combined entries;

a first sorting means operatively associated with said control means and third data storage means, for sorting said combined entries into sets and subsets, with each of said sets corresponding to one of a plurality of different postal mailing weight classifications, and with each of said subsets corresponding to one of a plurality of different designated postal delivery areas based upon said mailing addresses, and further for arranging said sets and subsets in a predetermined sequence of said combined entries;

image generating means operatively associated with said control means and said third dat. storage means, for generating a plurality of entry images, one image associated with each of said combined entries, each of said images including the mailing address and promotion legend of its associated combined entry;

a second sorting means operatively associated with said control means and third storage means for arranging said entry images in a printing sequence dependent upon said predetermined sequence;

multiple sheets of printing stock, each of said sheets being preprinted to bear information common to all of said promotions; and

a printing means for printing said entry images upon said sheets of printing stock according to said printing sequence to form multiple mailing items, each of the mailing items bearing said common information and a different one of the entry images, said mailing items being serially arranged to facilitate their collection into bundles corresponding to said subsets.

8. The apparatus of claim 7 wherein:

said first and third data storage means comprise magnetic disc drives, and said second data storage means comprises a magnetic tape drive.

9. The apparatus of claim 7 wherein:

each of said promotion legends includes a logo identifying a sponsor of the associated promotion.

10. The apparatus of claim 7 wherein:

each of said promotion legends includes textual material related to the promotion.

11. The apparatus of claim 7 wherein:

each of said promotion flags is a number unique to its associated promoti n, and said associated entry image includes said promotion number.

12. The apparatus of claim 7 wherein:

each of said data entries further includes a payee name identifying an individual, and an order number unique to the identified individual, and a value.

13. The apparatus of claim 12 wherein:

said mailing items comprise coupons.

14. The apparatus of claim 7 wherein:

at least selected ones of said mailing addresses include a postal zip code, and one of said sets corresponds to a bar code classification of mail printed with magnetically readable bar codes representing postal zip codes, said printing means utilizes magnetic ink, and each of said entry images including one of said selected mailing addresses further includes an associated postal zip code in human readable form and in magnetic bar code form.

15. The apparatus of claim 7 further including:

a fourth bit-encoded data storage means for storing multiple mailing location indicia and their corresponding postal zip codes;

said control means further operatively associate said fourth data storage means with said third data storage means to perform one of the following operations upon each of said combined entries: confirming the accuracy of a postal zip code contained in the entry, correcting an erroneous or incomplete zip code in the entry, and providing the entry with a zip code.

16. The apparatus of claim 7 wherein:

said pieces of printing stock comprise sheets arranged in stacks, each sheet being severable into a selected number of equally sized parts corresponding to said individual mailing items; and

said second sorting means reorders said predetermined sequence of said combined entries, to provide for printing of said selected number of entry images on each of said sheets whereby, upon a severing of each stack of sheets into said select number of separate stacks of said parts, each said stack or parts comprises one of said bundles of said mailing items.

17. An apparatus for preparing multiple individual promotional items involving a plurality of promotions, for mailing to multiple destinations in a sequence selected to reduce the cost of such mailing, including:

a first bit-encoded data storage means for storing a plurality of promotion entries, each promotion entry including a promotion flag and a promotion legend unique to one of said promotions;

a second bit-encoded data storage means for storing multiple data entries, each data entry including a mailing address and one of said promotion flags;

a control means for matching the promotion flags to operatively associate said first data storage means and said second data storage means, thereby to add each of said promotion entries to each of its associated data entries, thus to form multiple combined entries;

a third bit-encoded data storage means for storing said combined entries;

a fourth bit-encoded data storage means for storing a plurality of reverse side entries, each reverse side entry associated with one of said promotions;

said control means further matching the promotion flags to operatively associate said third and fourth data storage means, thereby to add each of said reverse side entries to its associated combined entry;

a first sorting means operatively associated with said control means and third data storage means, for sorting said combined entries into sets and subsets, with each of said sets corresponding to one of a plurality of different postal mailing weight classifications, and with each of said subsets corresponding to one of a plurality of different designated postal delivery areas based upon said mailing addresses, and further for arranging said sets and subsets in a predetermined sequence of said combined entries;

image generating means operatively associated with said control means and said third and fourth data storage means, for generating a plurality of entry images, one entry image associated with each of said combined entries, each f said entry images including the mailing address and promotion legend f its associated combined entry and the associated reverse side entry;

a second sorting means operatively associated with said control means and third storage means for arranging said entry images in a printing sequence dependent upon said predetermined sequence; and

a printing means for printing said entry images upon multiple sheets of printing stock according to said printing sequence to form multiple mailing items, each of said mailing items having an obverse side and a reverse side and bearing the mailing address and promotion legend on the obverse side and bearing the reverse side entry on the reverse side, said mailing items being serially arranged to facilitate their collection into bundles corresponding to said subsets.

* * * * *

THE WALL STREET JOURNAL.

Personal technology: Threats to privacy on-line become more worrisome

Wall Street Journal; New York; Oct 24, 1996; Mossberg, Watter S;

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Telecommunications policy
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Internet
Computer privacy

Abstract:
Walter S. Mossberg comments on threats to on-line privacy as the World Wide Web is about to explode into merchandising and advertising. Mossberg examines the the issues of computer privacy and the laws that will apply to on-line communications.

Full Text:

FOR YEARS, I've supported the idea of the personalization of software, and I still do. Computer software can do so much more for you, no matter what its basic function, if it knows something about your interests, needs and preferences, not to mention your work habits. The classic example is tax software, which "interviews" you about your finances and family structure and then uses that information to intelligently fill out your tax forms.

This also seems like a great idea on the Internet's World Wide Web. There are already some content providers that will provide a customized Web page showing news about just those subjects, stocks and sports teams you care about, based on questionnaires you fill out.

What's more, this personalization theme is about to explode into merchandising and advertising. A number of Web-based companies are working on Web sites and underlying technologies that will permit merchants to start offering you targeted goods and services based on detailed demographic profiles you submit.

For instance, if I say I'm a middle-class person who likes fishing, I might start seeing on-line ads and offers -- or receiving e-mail solicitations -- for fishing rods. Several companies are offering free e-mail service to people who submit detailed personal information and are willing to receive targeted ads, based on that information, with their e-mail. A new company, CyberGold, will soon launch an unusual Internet site (http://www.cybergold.com) at which people can earn nominal fees for merely reading on-line ads targeted at them -- if they submit detailed personal profiles.

THERE'S NOTHING wrong with such "one-to-one" marketing, and some consumers may want to be on the receiving end of it. But once you put a lot of information about yourself -- name, address, income, hobbies and interests -- on the Web, the potential exists for a massive invasion of your privacy. That information may be given away, or sold to, companies with fewer scruples than the one you dealt with originally.

Most of these companies, including CyberGold, pledge never to reveal your name, residence or e-mail

address to their participating advertisers, only generic demographic data. They act as intermediaries to steer the ads your way. But before you sign up with them, be careful. Check out their user agreements carefully to make sure these promises are ironclad. And remember, even if these companies are sincere about guarding your privacy, once information is on a computer linked to the Internet, it is vulnerable to theft or unintentional misuse.

At least these sorts of Web businesses rely on your voluntary participation. But like control over personal data in many other areas, there are some situations developing on the Web in which information about you might be made available without your permission or voluntary action. There are at least three forms of this involuntary publication of which I'm aware.

One, called "mining," involves using automated software to scoop up your e-mail address from public discussion groups in which you have participated and then publishing it on directory sites where anybody can retrieve it. A second practice involves companies trying to capture your "click stream," which is the history of what you choose to view on the Web, to ascertain your likes and dislikes and create a profile that can be sold to marketers.

The third technique involves publishing on the Web various government and other databases, such as Social Security or auto-registration data. These databases, while technically public in the past, were never made available to such a wide audience, including any sleazy salesman or deranged stalker with an Internet account.

IN FACT, there's a "Stalkers' Home Page" where you can see examples of the kinds of private information being made available on the Web. The page's author says that, despite its provocative name, it isn't meant as a service to stalkers but just the opposite -- "to raise the issue of how our future will be impacted by a database society." Its address is: http://pages.ripco.com:8080/glr/stalk.html

The real and potential invasion of privacy on-line is so serious that it may be one of the rare problems raised by the Internet that requires government intervention.

It seems to me that, in general, the government should avoid passing sweeping new Internet-related laws like the foolish Communications Decency Act. Instead, Congress and the courts should mainly take minimal steps to apply existing, tested laws covering appropriate topics -- like copyright and libel -- to the new on-line communications.

But the Internet threatens to have such a profound effect on our sense of privacy that this may be one of the rare areas where new protective laws and regulations will be appropriate. I don't know exactly what such rules might say. They would have to carefully carve out a middle ground between preserving exciting new business opportunities and the legitimate needs of researchers and investigators, on the one hand, and the right to privacy on the other.

Some Internet zealots will oppose such steps out of a naive view that the Internet is somehow above the law, others from a more realistic fear of overregulation. If something isn't done, however, I fear that the Internet will be seen as a dangerous place to do business, or that more and more people will try to protect themselves by hiding behind anonymous names on-line, a practice that has its own pernicious effects.

PTO/SB/29 (8/98)
Approved for use through 09/30/2000. OMB 0651-0032
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

CONTINUED PROSECUTION APPLICATION (CPA) REQUEST TRANSMITTAL

Submit an original, and a duplicate for fee processing.
(Only for Continuation or Divisional applications under 37 C.F.R. § 1.53(d))

CHECK BOX, if applicable:
☐ DUPLICATE

Address to:
Assistant Commissioner for Patents
Box CPA
Washington, DC 20231

Attorney Docket No. of Prior Application	
First Named Inventor	REUNING
Examiner Name	JEANTY
Group / Art Unit	2724
Express Mail Label No.	EK795075425US

This is a request for a ☒ continuation or ☐ divisional application under 37 C.F.R. § 1.53(d), (continued prosecution application (CPA)) of prior application number 08/984,650, filed on 3 Dec. 97, entitled Candidate Chaser.

NOTES

FILING QUALIFICATIONS: The prior application identified above must be a nonprovisional application that is either: (1) complete as defined by 37 C.F.R. § 1.51(b), or (2) the national stage of an international application in compliance with 35 U.S.C. 371. A Notice will be placed on a patent issuing from a CPA, except for reissues and designs, to the effect that the patent issued on a CPA and is subject to the twenty-year patent term provisions of 35 U.S.C. § 154(a)(2). Therefore, the prior application of a CPA may have been filed before, on or after June 8, 1995.

C-I-P NOT PERMITTED: A continuation-in-part application cannot be filed as a CPA under 37 C.F.R. § 1.53(d), but must be filed under 37 C.F.R. § 1.53(b).

EXPRESS ABANDONMENT OF PRIOR APPLICATION: The filing of this CPA is a request to expressly abandon the prior application as of the filing date of the request for a CPA. 37 C.F.R. § 1.53(b) must be used to file a continuation, divisional, or continuation-in-part of an application that is not to be abandoned.

ACCESS TO PRIOR APPLICATION: The filing of this CPA will be construed to include a waiver of confidentiality by the applicant under 35 U.S.C. 122 to the extent that any member of the public who is entitled under the provisions of 37 C.F.R. § 1.14 to access to, copies of, or information concerning, the prior application may be given similar access to, copies of, or similar information concerning, the other application or applications in the file jacket.

35 U.S.C. 120 STATEMENT: In a CPA, no reference to the prior application is needed in the first sentence of the specification and none should be submitted. If a sentence referencing the prior application is submitted, it will not be entered. A request for a CPA is the specific reference required by 35 U.S.C. 120 and to every application assigned the application number identified in such request, 37 C.F.R. § 1.78(a).

1. ☐ Enter the unentered amendment previously filed on _____ under 37 C.F.R. § 1.116 in the prior nonprovisional application.
2. ☒ A preliminary amendment is enclosed.
3. This application is filed by fewer than all the inventors named in the prior application, 37 C.F.R. § 1.53 (d)(4).
   a. ☐ *DELETE* the following inventor(s) named in the prior nonprovisional application:
   .....
   .....
   b. ☐ The inventor(s) to be deleted are set forth on a separate sheet attached hereto.
4. ☐ A new power of attorney or authorization of agent (PTO/SB/81) is enclosed.
5. Information Disclosure Statement (IDS) is enclosed:
   a. ☐ PTO-1449
   b. ☐ Copies of IDS Citations

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS (37 C.F.R. § 1.16(c) or (j))	21 -20* =	1	x $ 9 =	$ 9
	INDEPENDENT CLAIMS (37 C.F.R. § 1.16(b) or (i))	2 -3** =		x $ 39 =	—
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 C.F.R. § 1.16(d))			+ $ 130 =	
				BASIC FEE (37 C.F.R. §1.16)	345
				Total of above Calculations =	
	Reduction by 50% for filing by small entity (Note 37 C.F.R. §§ 1.9, 1.27 & 1.28).				
	* Reissue claims in excess of 20 and over original patent. ** Reissue independent claims over original patent.			TOTAL =	354

6. Small entity status:
   - a. ☐ A small entity statement is enclosed, if (b) and (c) do not apply.
   - b. ☑ A small entity statement was filed in the prior nonprovisional application and such status is still proper and desired.
   - c. ☐ Is no longer claimed.
7. The Commissioner is hereby authorized to credit overpayments or charge the following fees to Deposit Account No. _____-_____:
   - a. ☐ Fees required under 37 C.F.R. § 1.16.
   - b. ☐ Fees required under 37 C.F.R. § 1.17.
   - c. ☐ Fees required under 37 C.F.R. § 1.18.
8. ☒ A check in the amount of $ 354 is enclosed.
9. ☐ New Attorney Docket Number, if desired _____
   [Prior application Attorney Docket Number will carryover to this CPA unless a new Attorney Docket Number has been provided herein.]
10. a. ☒ Receipt For Facsimile Transmitted CPA (PTO/SB/29A)
    b. ☒ Return Receipt Postcard (Should be specifically itemized, See MPEP 503)
11. ☐ Other: .....

NOTE: ***The prior application's correspondence address will carry over to this CPA UNLESS a new correspondence address is provided below.***

12. NEW CORRESPONDENCE ADDRESS

☒ Customer Number or Bar Code Label — 22925 (Insert Customer No. or Attach bar code label here) — or ☐ New correspondence address below

Name	M. Pohl, Patent Attorney				
Address	55 Madison Ave, 4th Floor (P 4014)				
City	Morristown	State	NJ	Zip Code	07960
Country	USA	Telephone	(973) 665-0275	Fax	(973) 665-9152

13. SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Name (Print/Type)	Mark Pohl
Signature	Mark Pohl
Registration No. (Attorney/Agent)	35,325
Date	24 July 00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Stephen Michael REUNING
Serial No. : 08/984,650
Filed : 3 Dec 1997
Group Art : 2724
Examiner : Romain JEANTY
Title : "Candidate Chaser"

Commissioner of Patents & Trademarks
Washington, DC 20231

Sir:

PRELIMINARY AMENDMENT

In response to the Office Action dated May 1, 2000, please amend the above-identified application as follows:

IN THE CLAIMS

Claims 5, 8, 9, 11 and 20. Delete the phrase "or the like."

Claims 4 and 19. In the preamble, after the word "comprising," add --performing the following steps in the following sequence--

Claims 4 and 15-18. Claim 4, page 2, line 5, after the word "criteria," delete [,] and insert --and-- and delete the carriage return. Line 6, delete [f.] . Line 8, delete [g.] and insert --f.--. Claim 15, page 4, line 6, delete [h.] and insert --g.--. Claim 16, page 4, line 9,

delete [i.] and insert --h.--. Claim 17, page 4, line 13, delete [j.] and insert --i.--.

Claim 14. Page 4, line 2, delete the word [client] and replace it with --customer--. Page 4, line 3, replace the word [client] with --customer--.

REMARKS

Claims 4-24 are pending. Claims 4-24 have been rejected under § 112 and § 103. Reconsideration and allowance of the claims as amended is requested. I first discuss the prior art, and then the pending rejections. I discuss the § 103 rejections first, and the § 112 rejections afterwards.

THE PRIOR ART

The prior art includes various data bases where job openings can be listed and where candidates can submit their resumes. This art includes non-computer art such as newspaper and radio help-wanted or help-available classified advertisements. The art also includes computer based things like internet-based job-opening bulletin boards or resume data bases. Examples include McGovern, US Patent 5,978,768, and the various "Other Publications" cited therein as prior art (e.g., www.monsterboard.com, www.hotjobs.com, www.careermosaic.com, www.futurestep.com). The computer

based prior art, however, has functioned simply as electronic analogs of the non-computer art, broadcasting information on current job openings, and accepting resumes from candidates who are actively seeking employment.

For any job opening, however, many potentially excellent candidates may not be actively seeking employment when the job becomes available. Thus, these candidates will not necessarily get the information posted in the employment classified ads or the various internet job sites. Further, because these potentially excellent candidates may not be actively seeking employment, they may not circulate their resumes widely - if at all. Saliently, all of the prior art requires a potential candidate to search job openings (in the newspaper or the internet job sites, for example), write a resume, and then send the resume to a newspaper or internet site for storage in a data base and review. Potential candidates who do not do all of this, do not show up in the prior art resume data bases. Employers thus never get a chance to consider these candidates. This is unfortunate, because the very best candidates often are not currently seeking employment, and thus never get considered.

The claimed invention solves this problem. Rather than forcing a candidate to actively seek employment, the claimed invention can actually search for and find potential

candidates, even candidates *who are not actively seeking employment*, and do not even have a resume prepared at all. That's why Mr. Reuning calls his invention the "Candidate Chaser"; it chases good talent down, rather than waiting for good talent to find it. Thus, in contrast to the prior art, the claimed invention dispenses entirely with the requirement for a written resume, a data structure for uploading resumes, and the user interface required to make resume uploading easy. Unlike the prior art, the claimed invention can work without these structures at all.

We now turn to the pending rejections.

CLAIM REJECTIONS - 35 U.S.C. § 103

Claims 4-9 and 13-24 stand rejected under 35 U.S.C. § 103(a) as being obvious over McGovern et al. in view of Levine. Applicant respectfully traverses these rejections. McGovern discloses a data structure for storing resumes, while the claimed invention requires none. McGovern discloses searching this resume data structure to find potential candidates; in contrast, the applicant discloses a way of searching the Internet to find potential candidates, without using a data base of job openings or resumes at all.

Claims 4, 5, 13, 19 and 21

Claims 4, 5, 13, 19 and 21 stand rejected under 35 U.S.C. § 103(a) as being obvious over McGovern et al. in view of Levine because the Examiner believes that McGovern teaches each element of the applicant's claims except "sorting the Internet page." Reconsideration is requested, for three reasons. First, McGovern does not disclose the applicant's claimed sequence of performing these steps. Second, McGovern does not in fact disclose certain steps in applicant's claimed system. Third, McGovern and Levine should not be combined, as there is no suggestion in the art to combine them.

MCGOVERN DOES NOT DISCLOSE
APPLICANT'S CLAIMED
ORDERING OF THE STEPS

First, Applicant's claims (as amended) define a method. This method is performed in a certain sequence. This sequence allows the method to obtain an unexpected, synergistic and never-before achieved result.

An exception to this importance of sequence is in the two steps e. and f. of independent claim 4. It does not matter which of these two steps (e. and f.) precedes the other. Accordingly, applicant has amended claim 4 to combine these two steps into one step having two parts, each of which part may precede the other one.

McGovern, alone or combined with Levine, does not disclose applicant's claimed ordering of the steps. Thus, McGovern cannot anticipate the claimed method under § 103.

MCGOVERN DOES NOT
DISCLOSE EACH STEP
OF APPLICANT'S SYSTEM

Second, McGovern combined with Levine does not in fact disclose every step of applicant's system.

Applicant's independent claim 4 discloses a method comprising the step of "extracting from said Internet page or web posting an e-mail address." In contrast, McGovern does not disclose extracting an e-mail address; rather, McGovern discloses a system involving manually typing in (not automatically extracting) e-mail addresses. The text from McGovern cited as disclosing extraction does not in fact mention extraction. The text discloses, "enter[ing] in the spaces provided on the screen display 220 the Internet e-mail address of the person to which the resume is to be sent." McGovern at col. 17, lines 59-66. McGovern requires "entering" e-mail addresses, perhaps with the aid of an "address Book." See screen display 220. McGovern does not disclose extracting e-mail addresses.

Similarly, McGovern does not disclose a system involving getting an e-mail address - by extraction or otherwise - from an Internet page or web posting; McGovern's

e-mail addresses need to be individually sent to or input into the system.

Applicant's independent claim 4 discloses a method comprising "b. locating an Internet web page." In contrast, McGovern does not disclose a system involving locating an Internet web page; rather, McGovern discloses a system involving locating data in a data structure, which data structure is made accessible over the Internet. McGovern at col. 12, lines 46-52.

Applicant's independent claim 4 discloses a method comprising "c. reading at least a part of the text of said Internet page or web posting." In contrast, McGovern does not disclose a system involving reading at least a part of the text of said Internet page or web posting; rather, McGovern discloses a system involving uploading data to a data structure of submitted data ("if the remote site computer 44 determines that uploading . . . is permitted, the file uploading is completed"). McGovern at col. 14, lines 50-58.

Because McGovern does not disclose each of these steps, McGovern does not anticipate every element of the claimed method.

MCGOVERN AND LEVINE
CANNOT BE COMBINED

Third, McGovern and Levine cannot be combined. References may be combined for § 103 purposes only if the prior art contains a suggestion or a motivation to combine. E.g., In re Rouffet, 149 F.3d 1350 (Fed. Cir. 1998); Monarch Knitting Mach. Co. v. Sulzer Morat GmbH, 139 F.3d 877 (Fed. Cir. 1998). Here, a motivation to combine the cited references has not been disclosed in **the prior art.** See Office Action at 4 (1 May 2000).

The Other Claims

Claims 6 and 22 stand rejected under 35 U.S.C. § 103(a) as being obvious over McGovern et al. in view of Levine, because McGovern discloses using "an operator specified keyword or Boolean combination." As discussed above, McGovern does not disclose all the elements of the independent claims from which these claims depend. Therefore, McGovern cannot bar these dependent claims.

Claims 7-9, 20 and 23-24 stand rejected under 35 U.S.C. § 103(a) as being obvious over McGovern et al. in view of Levine, because McGovern discloses "software for screening resume." As discussed above, McGovern does not disclose all the elements of the independent claims from which these claims depend. Therefore, McGovern cannot bar these dependent claims.

Claim 14 stands rejected under 35 U.S.C. § 103(a) as being obvious over McGovern et al. in view of Levine, because McGovern discloses a web browser. As discussed above, McGovern does not disclose all the elements of the independent claims from which this claim depends. Therefore, McGovern cannot bar this dependent claim.

Claim 15 stands rejected under 35 U.S.C. § 103(a) as being obvious over McGovern et al. in view of Levine, because McGovern discloses a "job search system" and because McGovern discloses a method for "posting and searching job openings." As noted above, the applicant's system is not a "job search system," but a "candidate search system." As noted above, "posting and searching job openings" is not essential to the applicant's system.

Claim 16 stands rejected under 35 U.S.C. § 103(a) as being obvious over McGovern et al. in view of Levine, because "analyzing the [candidate's] response" is inherent in McGovern. As discussed above, McGovern does not disclose all the elements of the independent claims from which this claim depends. Therefore, McGovern cannot bar this dependent claim.

Claims 17-18 stand rejected under 35 U.S.C. § 103(a) as being obvious over McGovern et al. in view of Levine, because McGovern discloses (I) a "job search system"

and (II) "a method for posting and searching job openings" and (III) a system "which forwards responses (Col. 18, lines 11-22)." As noted above, the applicant's system is not a "job search system," but a "candidate search system." As noted above, the applicant's system does not "post and search job openings." It searches the internet, not job openings, and does not post job openings.

Claim 20 stands rejected under 35 U.S.C. § 103(a) as being obvious over McGovern et al. in view of Levine. As discussed above, McGovern does not disclose all the elements of the independent claims from which this claim depends. Therefore, McGovern cannot bar this dependent claim.

CLAIM REJECTIONS - 35 U.S.C. § 112

§ 112 ¶ 1 Rejections

Claims 7, 10-12 and 23 stand rejected under 35 U.S.C. §112, ¶1. These rejections are respectfully traversed, for two reasons. First, the independent claims from which these rejected claims depend, satisfy § 112. Section 112, ¶ 1 can be used to reject claims broader than those allowable under the written description of the initial disclosure. E.g., Gentry Gallery, Inc. v. Berkline Corp., 134 F.3d1961 (Fed. Cir. 1997); Regents of Univ. of Calif. V. Eli Lilly & Co., 119 F.3d 1559 (Fed. Cir. 1997). Section

112, however, cannot be used to reject claims narrower that those allowable under the written description of the initial disclosure. See id. Here, all claims rejected under § 112 are dependent claims, narrower than the independent claims already found allowable under § 112.

Second, any claimed matter not expressly mentioned in the specification was known to one of skill in the art as of the filing of the patent application. Claims 7 and 23 stand rejected under 35 U.S.C. §112, ¶1, as containing subject matter not described in the specification, as the term "natural language" is not expressly disclosed in the specification. This rejection is respectfully traversed, because since before the filing date of the application, the term "natural language" has been known in the art and has been described in numerous textbooks devoted to natural language processing. E.g., Rustin, R., Natural Language Processing (Algorithmics Publ., New York, NY 1973); Tennant, Harry R., Natural Language Processing (Petrocelli Books, NY 1981); Grosz, B.J. et al., Readings in Natural Language Processing (Morgan Kaufmann Publ., Los Altos, CA 1986); Perrault, R.C., "Natural Language Interfaces," in 1 Ann. Rev. Comp. Sci. 435 (1986); Gadzar, G. et al., Natural Language Processing in LISP (Addison Wesley Publ., Reading, MA 1989); Covington, M.G., Natural Language Processing for

Prolog Programmers (Prentice-Hall, Englewood Cliffs, NJ 1994). The meaning of the term "natural language" was yherefore widely known in the art when the application was filed. Thus, the term need not be expressly explained or disclosed in the specification. The Court of Appeals for the Federal Circuit recently held, "interpretation of what is disclosed must be made in light of the knowledge of one skilled in the art." Atmel Corp. v. Information Storage Devices, Inc., (slip op. 99-1082) (Fed. Cir., Dec. 28, 1999). In other words, § 112 is satisfied "if the patent applicant sets forth in the written description what one skilled in the art would need to know to make and use the claimed invention." See id. Because the term "natural language" was known in the art, it need not be expressly disclosed.

Claims 10-12 stand rejected under 35 U.S.C. § 112, ¶1 as containing subject matter not described in the specification, as the term "score and ranking" is not expressly disclosed in the specification. This rejection is respectfully traversed, because "scoring and ranking" has been known in the art since before the filing date of the application. Examiner has provided evidence of this, noting that "Levine discloses 'First class E-mail' which discloses the step of sorting and ranking e-mail messages." Office

Action at p. 4 (May 1, 2000). Because the meaning of "scoring and ranking" was widely known in the art when the application was filed, the term need not be expressly explained or disclosed in the specification. The Court of Appeals for the Federal Circuit recently held, "interpretation of what is disclosed must be made in light of the knowledge of one skilled in the art." Atmel Corp. v. Information Storage Devices, Inc., (slip op. 99-1082) (Fed. Cir., Dec. 28, 1999). In other words, § 112 is satisfied "if the patent applicant sets forth in the written description what one skilled in the art would need to know to make and use the claimed invention." See id. Because "scoring and ranking" was known in the art, it need not be expressly disclosed.

Claims 5-19 and 21-24 stand rejected under 35 U.S.C. § 112, ¶ 2 failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant believes the enclosed amendments to the claims make the claims particularly point out and distinctly claim the invention.

Claims 5, 8, 9, 11 and 20 stand rejected under 35 U.S.C. § 112, as the claim term "or the like" renders these claims indefinite. The claim term "or the like" is used and intended simply to encompass matter encompassed by the

claims automatically - as a matter of law - by the doctrine of equivalents. The phrase "or the like" may thus be deleted without changing the scope of the claims. Applicant thus amends the claims to delete this claim term.

Claim 14 stands rejected as the claim term "client" is unclear. Applicant accordingly amends the claim to substitute a claim term with a more clear meaning.

VALIDITY OF MCGOVERN REFERENCE

The Examiner notes that McGovern qualifies as a reference under 35 U.S.C. § 103 because it would qualify as a reference under 35 U.S.C. § 102(e). Applicant, however, conceived of the claimed invention before McGovern's May 8, 1997 filing date, and exercised diligence in reducing his conception to practice from before May 8, 1997 and continuously until applicant filed his patent application. Accordingly, enclosed is a Rule 131 Affidavit to swear behind McGovern.

Applicant believes, however, that that Affidavit is unnecessary, as the explanations given above fully distinguish McGovern from applicant's claimed invention. Accordingly, if the Examiner concludes that reliance on the Rule 131 Affidavit is necessary to allow the claims,

applicant respectfully requests that the Examiner expressly explain why, in the next Action.

Applicant notes that the Action dated May 1, 2000 appears to be misdated. The Action bears hand-written notations (apparently from a supervisory Examiner) initialed and dated "5-22-00." Further, the envelope for the Action was postmarked June 5, 2000. It thus appears the Action was mailed on or about June 5. Applicant thus respectfully requests that this paper be considered as filed within two months of the mailing date of that Action.

Applicant believes the amendments place the claims in condition for allowance. Applicant thus respectfully requests prompt allowance of the claims as amended.

CONCLUSION

Based on the above amendments and remarks, reconsideration and allowance of the application is believed warranted.

Respectfully submitted,

Mark POHL
Reg. No. 35,325 / Customer No. 22925
24 July, 2000
55 Madison Avenue, 4th floor (P4014)
Morristown, NJ 07960
☎ (973) 665-0275

X:\pohlm\dierdre\cpa.doc

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Stephen Michael REUNING
Serial No	:	08/984,650
Filed	:	03 Dec. 1997
Group Act Unit	:	2724
Examiner	:	Romain JEANTY
Title	:	Candidate Chaser

Commissioner of Patents and Trademarks
Washington, DC 20231

Sir:

RULE 1.131 DECLARATION

1. I am the inventor of record for the captioned patent application.

2. The prior are discloses many systems for collecting and distributing information on potential candidates actively seeking employment. Many qualified candidates, however, may not be actively seeking employment when a particular job opening occurs. Finding these potential candidates - who do not necessarily send their resume widely, if at all - was difficult to impossible.

3. I conceived of a system for searching for potential employment candidates. I conceived of a system including each of the elements of my currently-pending claims. I did this not later than September 10, 1996.

4. I began to reduce my conception to practice not later than September 10, 1996. On September 10, 1996, I purchased a subscription to Netcom (TM) internet service. Netcom is an Internet Service Provider. I purchased Netcom (TM) service expressly to reduce my conception to practice. I purchased Netcom (TM) internet service because it presented advantages my pre-existing internet service provider did not, for reducing my conception to practice. To evidence this purchase of Netcom (TM) internet service, I attach as an exhibit, a redacted copy of my September 14, 1996 American Express bill. The bill shows the purchase posted September 10, 1996.

5. On October 2, 1996, I discussed my conception with some business advisors at a confidential meeting. This meeting was at the Endicott House (Dedham, Massachusetts). To evidence this meeting, I enclose a redacted copy of my November 14, 1996 American Express statement. That statement shows my telephone charges while at the Endicott House.

6. At the October 2, 1996 meeting, I was advised that my idea was potentially patent able. Thus I searched for information on how to write a patent application. I

eventually learned of, and purchased a copy of, Pressman, David, Patent It Yourself (Nolo Press). I do not have a copy of the receipt showing my purchase of this book.

7. After learning how to write a patent application, I began to write a patent application for my invention. I completed a draft not later that November 3, 1997. On that date, I asked my niece, Melissa Rudelt, to witness my completed draft application. She did so. To evidence this; I attach a copy of the first page of this draft application showing in the upper right corner, my niece's signature and date. I mailed my patent application to the Patent Office, the end of November.

8. By July 1997, I had succeeded in reducing my system to practice and establishing that it works, on Apple Macintosh (TM) operating systems and computers. I announced this in the July 1997 edition of my internal company newsletter. That newsletter states, at pg. 3, Col. 1, "We can mail to five hundred targeted e-mail recipients per hour." I attach a copy of the newsletter as an exhibit.

9. Unfortunately, around this same time, Apple Computer Corp. began experiencing significant troubles. These troubles are detailed in the same edition of the newsletter, at page 1. The newsletter notes, "Diedre Moire presently employs MacOS as its main personal computer operating system. Recent problems at Apple Computer relating to the

operating system development failures has reduced the number of software developers…. Therefore, we will begin an operating system migration immediately." Accordingly, I thus needed to test my system on Windows computers to see if it operates in the Windows environment. On September 8, 1997, I purchased computer hardware sufficient to assemble a fully scaled up, commercially operable version of the system using Windows (TM) operating system. This is evidence by environment my purchase order for ten Compaq PRESARIO (TM) Model 2120 desktop computers, two Compaq PRESARIO (TM) V-400 monitors, and two BELKIN (TM) four-part switches. I attach a copy of the purchase order as an exhibit.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United State Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon or any patent to which this verified statement is directed

Stephen Michael REUNING
July 14, 2000

Closing Date
September 14, 1996

Detail Continu d — Amount $

dgust 26, 1996 ERTIFIED TOURS INC FT LAUDERDALE FL OUR SERVICES ference: 000000999999 Roc Number: 0000999999	3,093.00	SHR Ck ✓
ugust 27, 1996 IAC WAREHOUSE 800-925-6227 CT OMPUTERS/SFTWRE/HARWRE ference: 168654001 Roc Number: 0075992312	✓ 45.29	office Supply ✓
ugust 27, 1996 IAC WAREHOUSE 800-925-6227 CT OMPUTERS/SFTWRE/HARWRE ference: 167845700 Roc Number: 0075993080	✓ 532.95	Off Supplies ✓
ugust 28, 1996 IAC PC & PHOTO ZONE 800-248-9948 WA OFTWARE/HARDWARE ference: 923176700 Roc Number: 9231767000	✓ 4,299.00	Mach + Equip ✓
ugust 28, 1996 IAC PC & PHOTO ZONE 800-248-9948 WA OFTWARE/HARDWARE ference: 934633700 Roc Number: 9346337000	✓ 9,109.90	Mach + Equip ✓
ugust 29, 1996 IAC WAREHOUSE 800-925-6227 CT OMPUTERS/SFTWRE/HARWRE ference: 171846100 Roc Number: 0076161689	✓ 34.75	office Supplies ✓
eptember 3, 1996 OUNG ENTREPRENEURS ARLINGTON VA EMBERSHIP FEES/ACC ference: 024853958 703-527-4503	1,000.00 Giants Reunion 10/2-6	Dues ✓
eptember 4, 1996 IARPER COLLINS PBLSHSCRANTON PA UBLICATIONS ference: 022124896 Roc Number: 22124896	✓ 45.27	Education ✓
ept mber 4, 1996 IAC WAREHOUSE 800-925-6227 CT OMPUTERS/SFTWRE/HARWRE ference: 177194600 Roc Number: 0077077186	do not pay returned ordered 241.34 Amt is credited to the AMEX Acct. shown next statement	
eptember 5, 1996 EWSWEEK MOUNTAIN LAKES NJ AGAZINE/SUBSCRIPTIONS ference: 09355439	✓ 78.00	Subscriptions ✓
eptember 5, 1996 VOODBRIDGE HILTON ISELIN NJ INV#961098 ODGING/GIFTS/RESTAURANT ference: 000000961098 Roc Number: 0000961098	✓ 185.00 Reimb from YEO	~~Lodging~~ ✓ YEO
eptember 6, 1996 EW DYNASTY SEAFD PALAC ROBBINSVILLE NJ OOD AND BEVERAGE IP $2.00 ference: 000273214	✓ 24.00 OBrien	Computer Services ✓
eptember 6, 1996 IAC WAREHOUSE 800-925-6227 CT OMPUTERS/SFTWRE/HARWRE ference: 181688200 Roc Number: 0076710252	✓ 77.15	Off. Supplies ✓
eptember 10, 1996 RIMEHOST HOSTING 800-879-6882 VA OSTING SVC ference: 000000000 Roc Number: 0076928073	Web site 363.00	Trade shows ✓
eptember 10, 1996 ETCOM ON-LINE COMM SAN JOSE CA NLINE SERVICES ference: 000379723 Roc Number: 0033100433	5.00	telephone ✓
eptember 12, 1996 IAC PC & PHOTO ZONE 800-248-9948 WA OFTWARE/HARDWARE ference: 945988600 Roc Number: 9459886000	✓ 212.94	Off. Supplies ✓

Continu d on reverse

AMERICAN EXPRESS Cards

Platinum Card Statement of Account

Prepared For
STEPHEN M REUNING

Closing Date
November 14, 1996

Account Number
3713-828634-97007

Previous Card Balance $	Card Payments/Credits $	New Card Charges $	New Card Balance $
4,295.48	-4,295.48	630.72	630.72

Statement includes payments and charges received by November 14, 1996.
* Indicates posting date.

VENDOR #
ACCOUNT #
PAID 572.97

Terms - Payable in full upon receipt of statement.

Your Platinum Card account renews next month. For additional information, please refer to the Charge Card and Statement Information section which can be found on page 3.
Thank you for your continued Platinum Card membership.

If you have a question about your account, call 1-800-525-3355 (24 hours/7 days).

Join us in the Charge Against Hunger in Nov. & Dec. Help provide a meal for someone who is hungry. For more info. please refer to Cardmember Values or call (888)-8-TO-GIVE.

Please refer to page 3 for important information regarding your Card Account

PAID CHECK #
ACCOUNT #
VENDOR #

Card Detail

Amounts

Card Payments

November 2, 1996* PAYMENT RECEIVED - THANK YOU	-2,679.06
November 2, 1996* PAYMENT RECEIVED - THANK YOU	-1,616.42
Total of Card Payments	**-4,295.48**

Card Transactions for STEPHEN M REUNING

Card 3713-828634-97007

October 6, 1996 M I T ENDICOTT HOUSE DEDHAM MA LODGING/GIFTS/RESTAURANT Reference: 000000191469 Roc Number: 0000191469	✓ 80.95
October 21, 1996 GOVERNOR MORRIS HOTEMORRISTOWN NJ Arrival Date / Departure Date / No of Nights: 10/20/96 / 10/21/96 / 1 LODGING Reference: 029705110	110.36

Telephone Charges Birthing of Giants

Lodging

Continued on reverse

Please fold on the perforation below, detach and return with your payment

PURCHASE ORDER

TO PC Mall — SHIP TO DMC

ADDRESS 2645 Maricopa St. — ADDRESS

CITY Torrt, CA 90503-5144 — CITY

REQ. NO.	FOR	DATE REQUIRED	TERMS	HOW SHIP	DATE 9/8

	QUANTITY ORDERED	QUANTITY RECEIVED	PLEASE SUPPLY ITEMS LISTED BELOW	PRICE	UN
1	10		94165-Precario 2120	$685 00	68
2			Desktop Computer-150		
3			mz/24 ram/21e.B. HD/24		
4			8X CDRW		
5					
6	2		V-400 Black Precario	218 00	436
7			Monitor		
8					
9	2		Belkin 4 port Switches	293 00	586
10					
11			S/h		373.
12			Tax		
13					
14				7932	35
15			PO Amex		
16					
17			Cancelled		
18			Cab 9862		
19			Omniview		
20			4 Port PS/2		
21			Belkin		
22					

IMPORTANT

OUR ORDER NUMBER MUST APPEAR ON ALL INVOICES, PACKAGES, ETC.

PLEASE NOTIFY US IMMEDIATELY IF YOU ARE UNABLE TO SHIP COMPLETE ORDER BY DATE SPECIFIED.

PLEASE SEND ____ COPIES OF YOUR INVOICE WITH ORIGINAL BILL OF LADI

PURCHASING AGE

TOPS FORM 46146 ®

ORIGINAL

The Diedre Moire Newsletter

Keeping our employees, customers and investors informed — July, 1997

Special Report:

Automation R & D

Stephen Reuning dedicates every Monday to Research and Development. Instead of reporting to our corporate headquarters in Robbinsville, he begins his day on the internet working from his study at home or travels to computer industry vendors and consultants. With several goals to reach in a very short period oftime, he's discovered Mondays aren't enough and spends several nights a week and some weekends on Diedre Moire's Computer Automation Research Project (CARP). Following is a report submitted by Mr. Reuning discussing recent CARP developments.

REPORT: CARP 7/7/97

The purpose of our research is to ascertain what recent worldwide hardware and software product developments could support our corporate strategic goals while: improving our employees' quality of life, increasing productivity, improving products and services, and lowering costs. Several very specific areas of computer related products are being investigated., they include: personal computer operating systems; fax broadcasting software; database download and distribution software; browser software; electronic mail and news software, off-line browsing software; specialty WWW and Newsgroup multiple spider automated search and URL locating software; independent website download software; e-mail address file and folder dredging software; targeted bulk email and multiple newsgroup broadcasting systems; network software and hardware; data conferencing; personal portable computers and network and communications systems.

Personal computer operating systems

Diedre Moire presently employs MacOS as its main personal computer operating system. Recent problems at Apple Computer relating to operating system development failures has reduced the number of software developers committed to improvement and creation of application software for the Mac. While, as a user interface, Mac is a superior to Windows, our use of the system for corporate applications must consider several other factors: Ability to hire individuals already familiar with the operating system, diversity and quantity of vendors supporting the operating system, application providers' commitment to upgrade for the operating system, future update plans for the operating system (Apple's are sketchy), application software availability, cost competitiveness, maintenance availability.

In my opinion, our research indicates that Windows 98 will beat MacOS in many if not all the previously listed areas. Microsoft, the purveyor of Windows, is also setting the standard for many office, network, communications and internet applications. Only a small portion of those products are available to MacOS. Therefore we will begin an operating system migration immediately.

Fax broadcasting software

Fax documents are cheaper and faster to deliver than postal mail. Their delivery is more reliable and typically they are read. We are already employing a fax marketing program but the software in use has a very specific draw back, it will only merge up to 127 cover letter per batch. I have purchased and reviewed several other fax packages but they are not adequate.

Scott Shanes was absolutely amazed at the quick response to his first automated prospecting attempt on the WEB. A securement for Imclone Corporation on his first try! It was also Diedre Moire's first success of the Newsgroup Posts!!

Database download and distribution software

The Diedre Moire Resume Database is expanding as well as the rate in which data is being accumulated. We plan to expand the capacity of the system so we can increase the number of Information Coordinators inputting data. Furthermore we anticipate increasing modem capacity on the next UNIX computer upgrade so consultants can login from home. Our database tool developer, Bond ADAPT, has developed a Windows interface that will allow users to download files from the Diedre Moire Resume Database into their individual personal computers where they can use a What You See Is What You Get word processor to update and fax. I'm sure this is an exciting proposition to those who've attempted to use the UNIX version of WordPerfect! Furthermore, a resume image database will be maintained on line and available to users' personal computers using Bond's Windows interface. The system can also download field specific reports such as labeling in to be used on personal computer based applications such as mailmerge.

Browser software; electronic mail and news software

America Online may be the content king but their attitude towards customers sucks, in my opinion and lots of others based on what I've read recently. Scott Shanes had his newsposting ability canceled by AOL for two mistaken posts. Well, I'm selling my AOL stock and we are dumping AOL browsers.

I researched the new Netscape Communicator and Netscape Messenger and Netscape Collabra. Wow! These are great. The close runner up is Microsoft's Internet Explorer. Even though it seems a little more advanced and versatile now, we are not making Netscape our standard communications package. Instead I've chosen Microsoft Internet Explorer. It's already captured 40% of the browser market, a beta version of Internet Explorer 4.0 appears to have Communicator 4.0 beat for speed and versatility and Microsoft is integrating a great set of web development and communication tools such as Front Page, Personal Webserver, Net Meeting which will provide us with some powerful capabilities in a easy to use standardized format. Besides, if Bill Gates is going to take over the world we might as well join him.

Off-line browsing software

If you've sat in front of the computer waiting for pages to download, you'll be very excited about this one. Tell the software which URLs you want to review and it will download them all to a browser file. Then, later off-line you can read the pages at lightning speed. Several downloaded demos are testing as this is written. We'll have this available to you soon.

Specialty WWW and Newsgroup multiple spider automated search and URL locating software

I just purchased an application package that will search up to one hundred web search engines at a time while you are doing something else!!! Enter your query, enter the search engines (Yahoo, AltaVista, WebCrawler,etc.) you want searched and voile! it goes to work. The matching URLs are saved to a file. Follow up with independent website download software and you bring the data in from every URL so that you can browse it at your convenience OFF-LINE at lightning speed. PS: I can only find this software available for Windows. Another reason for changing our OS.

E-mail address file and folder dredging software

Upon using the previously mentioned WEB and Newsgroup searching systems, one could find herself with allot of data to sift through. Why not automate? The new "dredging" software purchased by Diedre Moire will read all those pages and extract the names and their associated e-mail addresses. The addresses are sorted in a database to be used by our new bulk e-mailing software.

Targeted bulk email and multiple newsgroup broadcasting systems.

We can mail to five hundred targeted e-mail recipients per hour. We can post help wanted messages to any of over 25,000 newsgroups instantly. It's like having a have dozen researchers prospecting for you.

Network software and hardware

Computers should make life and work easier, not harder. A mobile personal computer can provide you with instantaneous access to data stored on Diedre Moire's intranet which will include every computer on our network, instantaneous access to data stored on a world full of web sites and newsgroup postings, instantaneous access to clients, candidates and associates via e-mail, netmeetings and video conferencing. The upcoming Internet Explorer by Microsoft will provide access to the office network and the internet through the same easy to use browser interface. You'll communicate, fax, research, and view all through the same interface. We'll be installing on our local talk network at first and then upgrade to ethernet for speed. You'll be able to access all capabilities on the system from your computer.

Data Conferencing

New Internet applications allow Internet Explorer users to communicate with voice and video on-line while sharing a "whiteboard" on which they can draw diagrams or paste pictures, resumes etc.

Personal portable computers

Compaq computer company produces a line of laptops called the Presario series. It is self contained including, CD ROM, 3.5 Floppy, Windows, Modem, PCI slots, all ports. The line is reasonably priced and reliable. All Diedre Moire employees will be equipped with one once the entire

You'll be hearing more soon.

MAAPC Network Sharing begins

Diedre Moire is a member of an organization titled the Mid Atlantic Association of Personnel Consultants. It is an organization of approximately 160 separate employment agencies and recruiting firms. The association operates its own network broadcasting system however, it limits each firm to two candidates and two search assignments per week. Furthermore, their submission mechanisms are archaic and cumbersome. Therefore, Diedre Moire submits search assignments to MAAPC members via its own procedure.

Submissions to MAAPC members should be done on a weekly basis.

There are several components to the

Diedre Moire Corporation's newest stockholder.

submission system they are

The fax broadcasting system mounted on a Macintosh computer

The document "template DMC.20.400.028.
MAAPC.address file kept in the folder DMC.10.735.002 (this is the folder where we keep all the fax address books).

The job descriptions can be dictated and then typed into the form (template DMC.20.400.028 or typed directly into the template).

Never save the template. Instead when starting a new submission open the template then execute the save as command from the file menu and save the new document in the DMC.20.400.028 folder with the label DMC.20.400.028 (MM/DD/YY) where (MM=the month and DD=the day and YY=year).

The listings can be prepared by consultants individually or one central person can control the input into the document. The most important factor is to maintain the discipline and consistency of the listings. The listings must indicate the geography, the compensation, the company type, the job description and job requirements as displayed in the template DMC.20.400.028.

Once the document has been completed and is ready for faxing save the original document in the DMC.20.400.028 Masters2 folder and then copy the document into the appropriate fax station computer.
Open the document on the fax station computer. Select global fax from the chooser. Conduct the page setup from the file menu for the document. Select fax from the file menu. When the fax dialog window opens select the MAAPC address book. Then instruct the fax broadcaster to send the faxes to each member.

DMC ADAPT DataBase Improvements

Magic Search and AdHoc Search wouldn't recognize periods, ampersands, hyphens and slashes (.&-/) prior to June 2, 1997. Now, the searches do recognize those characters when followed by an integer or letter. So the Search for "H.R" can now be queried. We don't want to index the period after every sentence in the data base so words that end with a period followed by a space won't include the period. For example, the characters "H.R. Mgr." will be indexed as two separate sets of words "H.R" and "Mgr" (note the "." missing from the end of "H.R.".

Some People really love thier work!!!

16 pages witness only version signed by Melissa Rudelot on Nov 3, 1997

Melissa Rudelot

Nov 3, 1997

Patent Application of

Stephen M. Reuning

for

CANDIDATE CHASER VERSION ONE

Background - Field of Invention:

This invention relates to the process of recruiting new employees, specifically harvesting email addresses belonging to potential viable candidates from sites and postings searched for and found on the internet and sending specifically related help wanted advertisements via email to those addresses then receiving, filtering and distributing the response.

Background - Description of Prior Art

Classified help wanted advertising in print, ~~video~~ and ~~audio~~ media as well as postings of help wanted advertisements on internet web sites are a common practice. Such mediums for prospecting employment candidates are passive. They require the reaction of a potential job seeker who must be reading a specific periodical, watching or listening to a specific broadcast or visiting a specific internet web site or requested a specific push technology internet broadcast. The United States Federal Government predicts demand for technical labor in such areas as information technology, sciences, biotechnology and engineering to exceed supply by as much as fifteen percent by the year 2002. In such a situation competitive employers require more aggressive means to prospect employment candidate than the ~~latter~~ mentioned passive methodologies.

Bulk electronic mailing is a common process used to broadcast messages to groups of email addresses collected in databases however the processes used prior to Candidate Chaser are static and the targeting is dependent on pre-assembled databases of email addresses. In such cases where email address lists are procured from a database sources mailers are subject to limited accuracy on two catagories: first, are the addresses still active, second, are the individuals interested in receiving email related to the mailers' offerings. Furthermore, ~~present~~ the present state of ~~the~~ email address databases do not permit the targeting of addresses based on the individual miners online interest.

While unquestionably legal, there is a powerful lobby opposing general broadcasts of large untargeted and unsolicited bulk electronic mailings which consume huge amounts of internet communication bandwidth causing system delays, increased cost without benefit and failures. Such mailings are broadcast to high quantities, 50,000 - 200,000 addresses at a time, in the hopes that a fraction, perhaps one tenth of a percent will reach a viable and interested audience. Most of the bandwidth consumption would not be necessary if a more targeted approach was used.

Employers ~~seeking to hire qualified candidates~~ spend over a billion dollars every year in the United States on employment agency fees, classified advertising costs, recruiting staff, the design of recruitment programs and software and referral bonus programs. Many of those employers are large companies that have invested tremendous development resources into solving their recruiting problems and cost reduction yet not a single one of them has created an automated recruiting system like the Candidate Chaser machine patented herein. The articles attached and labeled as Prior Art Documents # 1 through #25 indicate a recruiting industry searching for internet solutions to recruiting difficulties yet none suggest a solution similar to that presented by the Candidate Chaser machine and process.

Most workers would like to be informed of employment opportunities with quality of life improving advantages including but not limited to compensation increases, advanced training, enhanced benefits, more challenge, diversity and improved career path provided notices of such opportunities were made at the workers' convenience and that workers are not overwhelmed with non-applicable offerings. Employment agencies and headhunters serve such a purpose but they are prohibitively expensive. No automated alternative was available until the herein described Candidate Chaser was invented.

Present job opportunity advertising systems take days and weeks to reach potential candidates.

MR 11/3/97

~~While my research indicates no present use of bulk electronic mail for targeted help wanted advertising, if conducted the use of available bulk email systems would result in "bad address" responses from servers, remove responses, and revenge "flames" from anti-spammers burdening the advertisers incoming electronic mail system.~~

However, to present

A search of the IBM Patent Server at http://patent.womplex.ibm.com looking for the following words individually in the "abstract" field: recruit, recruiting, hire, hiring, job, candidate, classified, position, bulk, addresses, and recruitment turned up no relevant matching or related patents. A search on the same database for the phrase "electronic mail" turned up no apparently related patents except those patenting the process of sending and receiving electronic mail itself. The patent information and abstract which appear most closely related are attached and labeled as: Prior Art Document #26 Patent 5245532, Prior Art Document #27 Patent 5040141, Prior Art Document #28 Patent 5632018, Prior Art Document #29 Patent 5408334, Prior Art Document # 30 Patent 5487100, and Prior Art Document #31 Patent 5613108.

A search for articles and publications discussing "recruiting on the Internet" turned up two hundred forty nine separate documents. While discussing the use of electronic mail for the circulation of resumes and discussion of job possibilities, no reference is ever made to any recruiting solution that even remotely resembles the Candidate Chaser machine and process. I believe this supports the unobviousness of the Candidate Chaser machine as a solution to recruiting difficulties. Those article which best represent present art on the subject are attached and labeled as Prior Art Documents #32 through #40.

"recruiting on the Internet"

There are a good number of commercially available computer software programs which can perform certain functions of the Candidate Chaser machine. However, none of them alone or in ~~double or triple~~ combination accomplish the task of the Candidate Chaser machine ~~but can only contribute as part of the unique combination of hardware and software and procedural compnents that make up the Candidate Chaser machine and process~~. The said commercially available computer software programs are described in the attached Prior Art Documents #1 through #25.

obvious process.

Objects and Advantages

The Candidate Chaser machine automatically locates Internet site pages and web postings which contain operator specified keywords or Boolean combinations and then extracts all email addresses from those pages as well as linked pages to as many linking levels as selected by the operator and then sends a job opportunity description enclosed in an electronic mail message to each of the extracted addresses then recieves responses from recipients of the job opportunity message then filters those messages by reading their text and forwards only desirable responses to the candidate seeking client's electronic mail address thusly sparing the client interaction with large amounts of irrelevant response while presenting viable candidates for a given job opening.

CC operator then commands

The ~~candidate seeking hiring entity~~ inputs keywords ~~into one interface~~ causing the Candidate Chaser machine to interact with the infinite number of interface possibilities available on the Internet. The operator is not required to conduct or observe the cumbersome, tedious, frustrating and agonizingly slow task of reviewing data contained on Internet web sites, newsgroup postings and other data sources that may exist from time to time on the net. ~~The CC~~ Once started the CC conducts the internet search without operator intervention.

The Candidate Chaser process does not use a static database as its source of addresses but instead takes advantage of the dynamic properties of the Internet where new information is added every minute somewhere on the planet. Candidate Chaser does this by reading internet sites online and extracting email addresses as they appear on targeted sites, postings and broadcasts just prior to broadcasting a job opportunity advertisement

Job opportunity announcements are communicated to potential candidates within hours.

Candidate Chaser job opportunity advertisements are delivered directly to the worker's email box therefore she/he is not required to search for applicable job offerings.

MM 11/2/17

Workers view the Candidate Chaser job opportunity advertisement by choice at their convenience any time night or day since the advertisement arrives and resides in the email message box until they take an action or their software automatically discards it based on their previously set filters.

Job opportunity advertisements broadcast by Candidate Chaser stimulate workers to consider new career opportunities even when they are not actively seeking new employment thusly expanding the universe of candidates beyond those available to the employer through passive advertising methodologies.

Specific job opportunity ads are only broadcast to specifically applicable individuals who made their email addresses available on their resumes, on web pages indicating subject matter related to the job opening or on new group postings where subjects related to the job opening were specifically discussed.

Individuals adverse to receiving additional job opportunity advertisements easily eliminate their addresses from any potential future mailings by typing "remove" into the message subject heading and executing their mail programs "reply" command.

The customized harvesting of email addresses focused on the specific needs of each job opportunity advertisement individually results in relatively low quantities of advertisements broadcast. And much less broadcast bandwidth waste due to non-applicable recipients.

The Candidate Chaser process costs less per hire to operate than other recruitment methods.

Responses to electronically mailed advertisements are automatically processed through software filters: protecting job opportunity advertisers from "flames", logging removes into a universal database without ~~user~~ operator disturbance, and sorting qualified responses to the appropriate hiring authorities email box.

MP. 11/3/97

Summary

The Candidate Chaser process uses a combination of publicly available and proprietary software computer programs and generally available computer hardware and computer peripherals to operate as a ~~single unit~~ means ~~which~~ to harvest & email addresses of specifically targeted individuals based on their work experiences and interests, then broadcast & a job opportunity advertisement to the recipients at the harvested addresses and then appropriatly sort & and redirect consequential response as desired.

Description

The typical Candidate Chaser machine consists of one or more general purpose computers equipped with microprocessor, ram, hard disk drive, a communication interface that links the computer(s) to the Internet, one or more keyboards and mouse interface, one or more monitors, and software to be described later. If one monitor is used with multiple computers then a KVM keyboard mouse monitor switch box is employed so operator may switch monitor and keyboard interfaces between computers.

The general purpose computers are physically connected to a network router that can consist of simple analog modems connected to simple telephone lines or more complex digital routing methods but in all cases access to the Internet is necessary.

Installed commercially available "offline browsing" computer software enables the operator to instruct the machine to locate websites and postings, accessed via the internet, which contain operator specified keywords or Boolean combinations and then to download and store the address of the located matching websites and postings into memory. The address is in the format of the URL (Universal Resource Locator)or other address indicator protocols used on the Internet. The machine ~~will~~ immediately or at another time downloads the text from the files at the addresses which were located and stored in memory.

The keywords and Boolean combinations entered into the machine should be closely related to the experiences, interests, capabilities, professional titles or talents desired in applicable job candidates.

The operator may instruct the machine to locate Hyper Text Markup Language Links, which are embedded addresses to other files on the Internet, on any of the website pages or postings turned up by the search. The operator may instruct the machine to follow the Links to their respective sites and locate more links at those sites. The operator may instruct the machine to follow the links as many level as desired. The number of link levels to search a dependent on the focus ~~accuracy~~ required of collection of addresses sought.

Once the text of a site or posting is downloaded into the machine's memory, the machine searches the text of the downloaded file for character strings representative of electronic mail addresses and saves those addresses in memory or disk storage. Presently, the electronic mailing protocol dictates that a filtering algorithm be used as follows: extract any string of characters that fits "space"_*@*.*_"space" where "*" is a wildcard variable representing any combination of characters.

If instructed to do so, the machine ~~will~~ continues to download and store site and posting addresses and download and store text into memory and extract addresses without continued operator action.

Collections of addresses may be stored in separate electronic storage files for repeated retrieval at later times.

Since the collected addresses are extracted from sites and postings containing the specified keywords or Boolean combinations, it is reasonable to predict that a consequential number of those addresses will belong to individuals with experiences, interests, capabilities, professional titles or talents related to those keywords or Boolean combinations.

Installed commercially available electronic mailing computer software enables the operator to instruct the machine to deliver a specific job opportunity advertising message to each address collected into a specific file. The operator types the copy into the machine keyboard interface and then instructs the machine to send the message to a specific collection of addresses at a specified time.

nnn 11/6/07

Each message has a "From" field and a "Reply to:" field in addition to others. When electronic mail messages are received, recipients look to the "From" and "Reply to:" fields for instructions relating to sending response messages. The operator of the CC machine may insert any electronic mail address into the "From" and "Reply to:" fields as she/he may desire. The Candidate Chaser machine is designed to handle many mailings at one time and could be used to serve multiple candidate seeking hiring clients. In the case of multiple clients, the "From" and "Reply to:" fields could contain the electronic mail address of the client for each given job opportunity message. Thus, each client would receive response to their message directly.

There are reasons why the operator of the Candidate Chaser machine might want to filter responses before received by the client. First, a significant percentage of the response is error messages due to the fact electronic mail addresses are terminated often without forwarding instructions. Second, a percentage of responses are requests to be removed from future mailings. Third, a significant percentage of messages are "thanks but no thanks but keep me notified of other stuff" responses. Fourth, a percentage of responses are notifications that the recipient is forwarding the message to someone that might be more interested. Fifth, only a small percentage of responses are from candidates that are interested in applying for the job.

In order to filter responses before they are directed to the client's electronic mail address the following procedure is used: A domain name is registered with InterNIC and the IP address location of a virtual mail server is designated. The virtual mail server is programmed to deliver all mail to one user logon at a specified POP3 channel. A single "Virtual Mail Server" (VMS) can be maintained on an Internet Service Provider (ISP) host for each Candidate Chaser machine or established on a private server. The VMS is designated by a domain name registered with Internic, for example "abcd123.com". Candidate Chaser clients are assigned Mail Accounts to the domain by the Candidate Chaser machine operator, for example 1001@abcd123.com. ~~The ISP provides~~ A Master User Name (MUN) for the domain on the VMS, for example smr@abcd123.com is programmed into the server. Electronic mail messages to potential candidates contain the client's assigned VMS mail account in the "reply" field so that responses are directed to the domain and recieved into the virtual mail server's storage.

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Consequently,

and the "To;" field in the response messages containing the client's mailing account address at the Candidate Chaser VMS domain. The electronic mail messages directed to different clients based on the address in the "To:" field, is downloaded from the VMS in a single COMBINED batch using the mail computer software program to access the MUN account. The mail program then filters and redirects the electronic mail message based on the filters and filter actions listed in the paragraphs that follow.

Mail containing spam complaints or requesting removal from lists are directed to the Candidate Chaser machine's remove list creating computer software program, which presently is ExtractorPro Reply Man but can be any similar performing software package, so the addresses are automatically added to the Candidate Chaser machine's remove list and NOT forwarded to the client. Error messages indicating non-deliverable messages are deleted and NOT forwarded to clients.

Messages attached containing resumes and curriculum vitae are forwarded to a designated resume collection electronic mail address. Any messages that were not forwarded to the remove site or deleted for non-delivery are forwarded to the client's personal mail address at their mail server, for example: sally@aol.com. Mail that doesn't match any filter is forwarded to the quality control staffs' mail address so they can inspect it and determine whether filters need adjustment.

Filters are set up using the "Filters" command language of any commercially available filter capable mailing computer software program. The following filter program is designed for a Candidate Chaser machine using ten general purpose computers where the computers are referenced by a sequencial labeling system with the labels as follows: Chase101, Chase102, Chase103, Chase104, Chase105, Chase106, Chase107, Chase108, Chase109, Chase110, where the unit referenced as Chase101 receives messages containing electronic mail addresses designated for addition the remove list

1. Checking Mail option = leave mail on server (Mail will be removed from server by filter actions only.)
2. Every filter should be set up for "incoming" mail.
   2.1. Filters

2.1.1. Removes to Chase101

2.1.1.1. Subject contains "remove" or "spam" action equals make subject "Remove" then action equals redirect to chase101@~~ix.netcom.com~~ domain.com then server option equals "delete" then action equals "Skip Rest".

2.1.1.2. Subject contains "fuck"* or "shit" action equals make subject "Remove" then action equals redirect to chase101@ix.netcom.com then server option equals "delete" then action equals "Skip Rest". *Note: full disclosure

2.1.1.3. Subject contains "bastard" or "revenge" action equals make subject "Remove" then action equals redirect to chase101@ix.netcom.com then server option equals "delete" then action equals "Skip Rest".

2.1.1.4. Subject contains "unsubscribe" or "junk" action equals make subject "Remove" then action equals redirect to chase101@ix.netcom.com then server option equals "delete" then action equals "Skip Rest".

2.1.1.5. Subject contains "garbage" or "trash" action equals make subject "Remove" then action equals redirect to chase101@ix.netcom.com then server option equals "delete" then action equals "Skip Rest".

2.1.1.6. Body contains "remove" or "spam" action equals make subject "Remove" then action equals redirect to chase101@ix.netcom.com then server option equals "delete" then action equals "Skip Rest".

2.1.1.7. Body contains "fuck" or "shit" action equals make subject "Remove" then action equals redirect to chase101@ix.netcom.com then server option equals "delete" then action equals "Skip Rest".

2.1.1.8. Body contains "bastard" or "revenge" action equals make subject "Remove" then action equals redirect to chase101@ix.netcom.com then server option equals "delete" then action equals "Skip Rest".

2.1.1.9. Body contains "garbage" or "trash" action equals make subject "Remove" then action equals redirect to chase101@ix.netcom.com then server option equals "delete" then action equals "Skip Rest".

2.1.2. Undeliverables Deleted

1 1

2.1.2.1. Subject contains "deliver" or "error" then action equals server option "delete" then "Skip Rest"

2.1.2.2. Subject contains "unknown" or "bad" then action equals server option "delete" then "Skip Rest"

2.1.2.3. Subject contains "illegal" or "fail" then action equals server option "delete" then "Skip Rest"

2.1.3. Resume attached

2.1.3.1. Subject contains "resume" or "vitae" then action equals redirect to reuning2@ix.netcom.com

2.1.3.2. Body contains "resume" or "vitae" then action equals redirect to reuning2@ix.netcom.com

2.1.4. Forward to customer everything not deleted and matching their address

2.1.4.1. To contains XXX@abcd123.com then action equals redirect to user@theirdomain.com and server option equals delete and action equals "Skip Rest"

Notice: every client requires one of these filters

2.1.5. Forward non filtered items to Quality Control Person - Theoretically nothing should be available to filter at this point

2.1.5.1. To "appears" then redirect to qc@qcdomaine.com then server option equals delete and "Skip Rest"

Each Candidate Chaser machine is designated its own Master User Name at a Virtual Mail Server where a domain name specific to ~~the tower~~ a machine is registered, for example "abcd123.com". ALL mail sent to any variation of XXX@abcd123.com , where XXX represents any designated client address assigned to that domain, ~~can~~ is be downloaded in one batch to ~~by~~ the mail processing computer software program by accessing the assigned user name via the assigned POP3 channel. For example the user "SMR" may download all mail sent to the domain "abcd123.com" through the POP "mailhost.yourisp.net". In this case the ISP maintains the server on its domain called "mailhost.yourisp.net". Often the ISP will use the MUN domain as the POP3 channel so that it is possible to download the mail using a user name such as "SMR" through the POP3 channel "abcd123.com" or whatever other domain name is assigned by the ISP.

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messages then redirect messages to desired mailboxes based on said analysis and sort.

Abstract

The Candidate Chaser machine automatically locates Internet site pages and web postings which contain operator specified keywords or Boolean combinations and then extracts all email addresses from those pages as well as linked pages to as many linking levels as selected by the operator and then sends a job opportunity description enclosed in an electronic mail message to each of the extracted addresses then recieves responses from recipients of the job opportunity message then filters those messages by reading their text and forwards only desirable responses to the candidate seeking client's electronic mail address thusly sparing the client interaction with large amounts of irrelevant response while presenting viable candidates for a given job opening. It applies a distinctive and non-obvious method for delivering identical electronic mail messages to a group of targeted potential job candidates sharing a specifically desired single or set of common experiences, interests, capabilities, professional titles or talents relating to the needs of the candidate seeking hiring entity and handling their response.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/911,024	07/24/2001	Stephan Michael Reuning	Diedre/Prospector	4537

22925 7590 09/16/2002

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EXAMINER	
OUELLETTE, JONATHAN P	
ART UNIT	**PAPER NUMBER**
3629	

DATE MAILED: 09/16/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

UNITED STATES
PATENT AND
TRADEMARK OFFICE

An Agency of the United States
Department of Commerce

Fax Cover Sheet

To: Mark Pohl (35325)

Fax: (973) 665-9152

From: Jon Ouellette

Fax: (703) 308-3691

Documents Attached: 13
(Including Cover)

Re: Application 09/911,024

9/23/2002

Mr. Pohl – Please find the attached office action information for application 09/911,024.

If you require additional information – please call me (703) 605-0662.

Thank You,

Jon Ouellette

Office Action Summary	Application No.	Applicant(s)	
	09/911,024	REUNING ET AL.	
	Examin r	Art Unit	
	Jonathan Ouellette	3629	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 July 2001 and 18 March 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-66* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-66* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 35 is objected to because of the following informalities: Claim 35 should logically be dependent of claim 34 in order to avoid any double patenting issues. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 20 and 53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims 20 and 53 recite the limitation "said contact information" in the method/system of Claims 19 and 52. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> a. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-11, 13-25, 33-44, 46-58, and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hartman et al. (US 2002/0111958 A1) in view of Mossberg (Wall Street Journal, Oct. 24, 1996), further in view of Borguraev (US 5,799,268).
7. As per independent Claims 1 and 34, Hartman discloses a method of collecting professional profile data, Identifying contact information data, and Storing said Professional Profile and said contact information data into a data structure (Abstract, Para 0007-0009, Para 0014, Para 0018-0019).
8. Hartman fails to disclose a method for harvesting professional profiles, the method comprising: Searching the Internet, Identifying web pages and Internet postings containing profile data.
9. Mossberg discloses a method for harvesting professional profiles, the method comprising: Searching the Internet, Identifying web pages and Internet postings containing profile data (Para 8-9).
10. Neither Hartman nor Mossberg disclose identifying in said professional profile text strings constituting contact information data.
11. Borguraev teaches identifying information data in document text strings (Abstract, C4 58-67, C5 L1-46, C57 L11-41, C65 L46-67, C66 L1-5).
12. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a method for harvesting professional profiles, the method comprising: Searching the Internet, Identifying web pages and Internet postings containing profile data, and identifying in said professional profile text strings constituting

contact information data as disclosed by Borguraev in the system disclosed by Mossberg, in the system disclosed by Hartman, for the advantage of providing a method of collecting professional profile data with internet data harvesting capabilities.

13. As per Claims 2 and 35, Hartman, Mossberg, and Borguraev disclose wherein said contact information comprises an extractable e-mail address (Mossberg: Para 8-9).

14. As per independent Claims 3 and 36, Hartman, Mossberg, and Borguraev disclose a method for normalizing data from a document containing professional profile data, the method comprising: Obtaining said document, Reading said document, Identifying in said document text strings constituting contact information data, and Storing said professional profile data and said contact information data into a data structure (Hartman: Abstract, Para 0007-0009, Para 0014, Para 0018-0020, Clms 1-2) (Borguraev: Abstract, C4 58-67, C5 L1-46, C57 L11-41, C65 L46-67, C66 L1-5).

15. As per Claims 4 and 37, Hartman, Mossberg, and Borguraev disclose wherein said contact information comprises an extractable e-mail address (Mossberg: Para 8-9).

16. As per Claims 5 and 38, Hartman, Mossberg, and Borguraev disclose reading documents and combining to create a professional profile, Identifying in said professional profile text strings constituting contact information data, and copying said professional profile and contact information data into a data structure (Hartman: Abstract, Para 0007-0009, Para 0014, Para 0018-0020, Clms 1-2).

17. As per Claims 6 and 39, Hartman, Mossberg, and Borguraev disclose sorting the data in said data structure to identify profiles meeting a specified parameter, and merging said contact

information with a pre-defined document template to create a personalized document (Hartman: Abstract, Para 0018-0020, Clms 1-2, Figs. 3-4)

18. As per Claims 7 and 40, Hartman, Mossberg, and Borguraev disclose wherein said professional profile is obtained by harvesting from the Internet (Mossberg: Para 8-9).

19. As per Claims 8, 16, 23, 41, 49, and 56, Hartman, Mossberg, and Borguraev disclose wherein said professional profile is obtained from a third party source (Hartman: Para 0003 and 0011).

20. As per Claims 9 and 42, Hartman, Mossberg, and Borguraev disclose wherein said professional profile is obtained via a professional profile collection program on a website (Hartman: Abstract, Para 0018-0020, Clms 1-2).

21. As per Claims 10, 18, 25, 43, 51, and 58, Hartman, Mossberg, and Borguraev disclose wherein said professional profile is obtained as a response to help wanted advertising (Hartman: Para 0003).

22. As per Claims 11 and 44, Hartman, Mossberg, and Borguraev disclose wherein said pre-defined document template can incorporate an electronic object (Hartman: Abstract, Para 0018-0020, Clms 1-2).

23. As per Claims 13-14, 19, 46-47, and 52, Hartman, Mossberg, and Borguraev disclose a method for creating a list of sales or advertising prospects, the method comprising: Obtaining professional profiles, Storing said professional profiles in a data structure, and Sorting to identify a subset of professional profiles stored in said data structure (Hartman: Abstract, Para 0018-0020, Clms 1-2).

24. As per Claims 15, 22, 48, and 55, Hartman, Mossberg, and Borguraev disclose wherein said professional profile is obtained by harvesting from the internet (Mossberg: Para 8-9).

25. As per Claims 17, 24, 50, and 57, Hartman, Mossberg, and Borguraev disclose wherein said professional profile is obtained via a professional profile collection program on a website (Hartman: Abstract, Para 0018-0020, Clms 1-2).

26. As per Claims 20 and 53, Hartman, Mossberg, and Borguraev disclose exporting said contact information data from said subset of professional profiles to create a list (Borguraev: Abstract, C4 58-67, C5 L1-46, C57 L11-41, C65 L46-67, C66 L1-5, C68 L5-32, Fig.8, Fig.10).

27. As per Claims 21 and 54, Hartman, Mossberg, and Borguraev disclose wherein said list may take the form of: A printed list, A digital file, A delimited format file, A format which causes a message to be delivered to each professional profile's contact, or A merged document (Borguraev: Abstract, C68 L5-32, Fig.8, Fig.10).

28. As per independent Claims 33 and 66, Hartman, Mossberg, and Borguraev disclose a method of selecting advertisement and notice delivery addresses, the method comprising: Searching a data structure containing professional profiles, Identifying a subset of professional profiles, Identifying in said professional profiles text strings constituting contact information data, and Exporting said contact information data (Hartman: Abstract, Para 0018-0020, Clms 1-2) (Mossberg: Para 8-9) (Borguraev: Abstract, C4 58-67, C5 L1-46, C57 L11-41, C65 L46-67, C66 L1-5).

29. Claims 12 and 45 are rejected under 35 U.S.C. 103 as being unpatentable over Hartman, Mossberg, and Borguraev.

30. As per Claims 12 and 45, Hartman, Mossberg, and Borguraev do not expressly show wherein said pre-defined document template includes an advertising message.

31. However these differences are only found in the nonfunctional descriptive material and are not functionally involved in the steps recited. The pre-defined document template would be created regardless of what was included in the template. Thus, this descriptive material will not distinguish the claimed invention from the prior art in terms of patentability, *see In re Gulack*, 703 F.2d 1381, 1385, 217 USPQ 401, 404 (Fed. Cir. 1983); *In re Lowry*, 32 F.3d 1579, 32 USPQ2d 1031 (Fed. Cir. 1994).

32. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included an advertising message in the pre-defined document template, because such a message does not functionally relate to the steps in the method claimed and because the subjective interpretation of the message does not patentably distinguish the claimed invention.

33. Claims 26-32 and 59-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hartman et al. in view of Mossberg, and further in view of Peach et al. (US 5,321,604).

34. As per independent Claims 26 and 59, Hartman and Mossberg disclose a method comprising: sorting professional profiles in a data structure, and merging contact information from said professional profiles into said deliverable medium (Hartman: Abstract, Para 0018-0020, Clms 1-2).

35. Hartman and Mossberg fail to disclose selecting one or more items from a collection of computer stored images, computer stored text objects, computer stored audio objects,

computer stored video objects, or other computer stored objects, Combining said selections into a deliverable medium.

36. Peach teaches selecting one or more items from a collection of computer stored images, computer stored text objects, computer stored audio objects, computer stored video objects, or other computer stored objects, Combining said selections into a deliverable medium (Abstract, C2 L1-6, C2 L61-69, C3 L1-40, C13 L49-68, C14 L1-34).

37. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included selecting one or more items from a collection of computer stored images, computer stored text objects, computer stored audio objects, computer stored video objects, or other computer stored objects, and combining said selections into a deliverable medium, as disclosed by Peach in the system disclosed by Mossberg, in the system disclosed by Hartman, for the advantage of providing a method of collecting professional profile data with internet data harvesting capabilities, and direct mail advertising capabilities.

38. As per Claims 27 and 60, Hartman, Mossberg, and Peach disclose delivering said deliverable medium to prospects (Peach: Abstract, C2 L1-6, C2 L61-69, C3 L1-40, C13 L49-68, C14 L1-34).

39. As per Claims 28 and 61, Hartman, Mossberg, and Peach disclose printing said deliverable medium as a post card or letter (Peach: Abstract, C2 L1-6, C2 L61-69, C3 L1-40, C13 L49-68, C14 L1-34).

40. As per Claims 29 and 62, Hartman, Mossberg, and Peach disclose wherein said professional profile is obtained by harvesting from the internet (Mossberg: Para 8-9).

41. As per Claims 30 and 63, Hartman, Mossberg, and Peach disclose wherein said professional profile is obtained from a third party source (Hartman: Para 0003 and 0011).

42. As per Claims 31 and 64, Hartman, Mossberg, and Peach disclose wherein said professional profile is obtained via a professional profile collection program on a website (Hartman: Abstract, Para 0018-0020, Clms 1-2).

43. As per Claims 32 and 65, Hartman, Mossberg, and Peach disclose wherein said professional profile is obtained as a response to help wanted advertising (Hartman: Para 0003 and 0011).

Conclusion

44. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

45. The following patents are cited to further show the state of the art with respect to employment systems in general:

U.S. Pat. No. 5,784,608 to Meske, Jr. et al.
U.S. Pat. No. 5,855,015 to Shoham
U.S. Pat. No. 5,855,020 to Kirsch
U.S. Pat. No. 5,907,837 to Ferrel et al.
U.S. Pat. No. 5,978,768 to McGovern et al.
U.S. Pat. No. 6,038,560 to Wical
U.S. Pat. No. 6,041,326 to Amro et al.
U.S. Pat. No. 6,055,510 to Henrick et al.
U.S. Pat. No. 6,101,486 to Roberts et al.
U.S. Pat. No. 6,119,164 to Basche
U.S. Pat. No. 6,272,467 to Durand et al.

46. The following foreign patents are cited to further show the state of the art with respect to employment systems in general:

Japan Pat. No. JP2000082066A

47. The following non-patent literature is cited to further show the state of the art with respect to employment systems in general:

McFadden, Mark, "Spam, Spam, wonderful Spam. Not!" HP Professional, v10, n9, p56(1), Sept. 1996.

48. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Ouellette whose telephone number is (703) 605-0662. The examiner can normally be reached on Monday through Thursday, 8am - 5:00pm.

49. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Weiss can be reached on (703) 308-2702. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7687 for regular communications and (703) 305-3597 for After Final communications.

50. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-5484.

jo
September 23, 2002

Please type a plus sign (+) inside this box →

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(use as many sheets as necessary)

Sheet 1 of 4

Complet If Known	
Application Number	
Filing Date	
First Named Inventor	REUNING
Group Art Unit	
Examiner Name	~~RIMMER~~ OUELLETTE
Attorney Docket Number	Diedre / Prospector

09/911024
09/24/01

#4

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Document Number	Kind Code[2] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		5 796 395		de Hond		
		5 835 087		Herz		
		5 552 994		Cannon		
		5 644 723		Deaton		
		5 649 220		Yoseff		
		5 805 810		Maxwell		
		5 933 811		Angles		
		5 841 658		Bouchard		
		5 937 037		Kamel		
		5 873 073		Bresnan		
		5 819 241		Reiter		
		5 993 048		Banks		
		5 845 302		Cyman		
		5 966 695		Melchione		
		5 918 220		Sansone		
		5 948 061		Merriman		
		5 809 481		Baron		
		5 963 968		Warmus		

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Office[3]	Number[4]	Kind Code[5] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	9/9/2002

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] Unique citation designation number. [2] See attached Kinds of U.S. Patent Documents. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 2 of 4

Complete if Known	
Application Number	
Filing Date	
First Named Inventor	Rawlings
Group Art Unit	
Examiner Name	
Attorney Docket Number	Diedre/Prospector

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	U.S. Patent Document Number	Kind Code[2] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
JB		6 067 348		Hibbler		
JB		6018 774		Mayle		
JB		6 101 485		Fortenberry		
JB		6 131 101		Martino		
JB		6 173 274		Ryan		
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JB		6 178 411		Reiter		
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JB		6 216 129		Eldering		
JB		6 205 452		Warmus		

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Office[3]	Number[4]	Kind Code[5] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

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Sheet 3 of 4

Complet If Known	
Application Number	
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First Named Inventor	Barbara Reaning
Group Art Unit	
Examiner Name	
Attorney Docket Number	Diedre / Prospector

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		Yaşar TONTA, Indexing In Hypertext Databases, in Studies in Multimedia, p. 21-30 (Learned Inf., publ. 1992)	
		J.M. GLOVER, Top Ten Ways To Improve, http://www.sau.edu./cgi/curt/Webgraph/imp8.htm (Aug. 3, 1996)	
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		M. KOSTER, Robots On The Web, ConneXions v. 9 (Interop Co. publ. ~~Apr~~ 1997).	
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		Bond Int'l Software plc., Adapt Design Manual v. 8.7 (Bond Int'l Software, publ., Aug. 2000).	
		Xerox Corp., DocuColor 130CSX Digital Color..., (Xerox Corp., Sept. 00).	
		GLOVER, J.M., Sucky To Saaavy, http://www.jeffglover.com/ss/saaavy02.php (Sept. 2000).	
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Examiner Signature		Date Considered	9/3/200-

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 4 of 4

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Filing Date	
First Named Inventor	Reuning
Group Art Unit	
Examiner Name	
Attorney Docket Number	Diedre/Prospector

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
[illegible]		Xerox Corp. Variable Information Customer Expectations ..., (Xerox Corp., 3 March 2001).	
[illegible]		Xerox Corp., DocuColor 2000 CSX ... (Xerox Corp. 2001)	
[illegible]		Robots And Web Site Spidering, http://bargain devil.com/robots.html (SuperiorSoftware, publ. (7 June 2001).	
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		~~REUNING, S.M.~~,	

Examiner Signature	[signature]	Date Considered	9/9/2002

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Notic of Ref rences Cited	Application/Control No. 09/911,024	Applicant(s)/Patent Under Reexamination REUNING ET AL.	
	Examiner Jonathan Ouellette	Art Unit 3629	Page 1 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,758,324	05-1998	Hartman et al.	707/2
	B	US-5,784,608	07-1998	Meske et al.	704/10
	C	US-5,799,268	08-1998	Boguraev, Branimir K.	707/4
	D	US-5,855,015	12-1998	Shoham, Yoav	707/10
	E	US-5,855,020	12-1998	Kirsch, Steven T.	707/104.1
	F	US-5,907,837	05-1999	Ferrel et al.	705/1
	G	US-5,978,768	11-1999	McGovern et al.	706/50
	H	US-6,038,560	03-2000	Wical, Kelly	707/10
	I	US-6,041,326	03-2000	Amro et al.	705/1
	J	US-6,055,510	04-2000	Henrick et al.	705/14
	K	US-6,101,486	08-2000	Roberts et al.	709/223
	L	US-6,119,164	09-2000	Basche, Todd	705/1
	M	US-6,272,467	08-2001	Durand et al.	705/1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N	JP 2000082066 A	03-2000	Japan		G06F 12/00
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	McFadden, Mark, "Spam, Spam, wonderful Spam. Not!" HP Proffesional, v10, n9, p56(1). Sept. 1996.
	V	Mossberg, Walter S., "Personal technology: Threats to privacy on-line become more worrisome," The Wall Street Journal, New York, B1, Oct. 24, 1996.
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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Notice of References Cit d	Application/Control No. 09/911,024	Applicant(s)/Pat nt Under Reexamination REUNING ET AL.	
	Examiner Jonathan Ouellette	Art Unit 3629	Page 2 of 2

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-5,321,604	06-1994	Peach et al.	209/3.1
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
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The below text replaces the pre-printed text under the heading, "Information on How to Effect Drawing Changes," on the back of the PTO-948 (Rev. 03/01, or earlier) form.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities -- 37 CFR 1.85

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the Notice of Allowability. Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136(a) or (b) for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit the drawing corrections within the time period set in the attached Office communication. See 37 CFR 1.85(a).

Failure to take corrective action within the set period will result in ABANDONMENT of the application.

06/01/01

United States Court of Appeals for the Federal Circuit

03-1138

MICROSOFT CORPORATION,

Plaintiff-Appellee,

v.

MULTI-TECH SYSTEMS, INC.,

Defendant-Appellant.

03-1139

MULTI-TECH SYSTEMS, INC.,

Plaintiff-Appellant,

v.

NET2PHONE, INC.,

Defendant-Appellee.

Constantine L. Trela, Jr., Sidley Austin Brown & Wood, of Chicago, Illinois, argued for plaintiff-appellee 03-1138, Microsoft Corporation. With him on the brief were David T. Pritikin, Richard A. Cederoth, Douglas I. Lewis, and Russell E. Cass.

Ronald J. Schutz, Robins, Kaplan, Miller & Ciresi L.L.P., of Minneapolis, Minnesota, argued for plaintiff-appellant in 03-1139, Multi-Tech Systems, Inc., and defendant-appellant in 03-1138, Multi-Tech Systems, Inc. With him on the brief were Emmett J. McMahon, Ken R. Hall, and Misti Nelc.

Michael R. Casey, Oblon, Spivak, McClelland, Maier & Neustadtt, P.C., of Alexandria, Virginia, argued for defendant-appellee in 03-1139, Net2Phone, Inc. With him on the brief were Richard D. Kelly and Derek Richmond. Of counsel was Kenneth T. Cuccinelli, Oblon, Spivak, McClelland, Maier & Neustadt, P.C., of Arlington, Virginia.

Both appealed from: United States District Court for the District of Minnesota

Judge Ann D. Montgomery

United States Court of Appeals for the Federal Circuit

03-1138

MICROSOFT CORPORATION,

Plaintiff-Appellee,

v.

MULTI-TECH SYSTEMS, INC.,

Defendant-Appellant.

03-1139

MULTI-TECH SYSTEMS, INC.,

Plaintiff-Appellant,

v.

NET2PHONE, INC.,

Defendant-Appellee.

DECIDED: February 3, 2004

Before LOURIE, RADER, and BRYSON, Circuit Judges.

Opinion for the court filed by Circuit Judge LOURIE. Dissenting opinion filed by Circuit Judge RADER.

LOURIE, Circuit Judge.

Multi-Tech Systems, Inc. appeals from the order of the United States District Court for the District of Minnesota entering final judgment of noninfringement of U.S. Patents 5,600,649; 5,764,627; and 5,790,532 in favor of Microsoft Corporation. Microsoft Corp. v. Multi-Tech Sys., Inc., No. 00-CV-1412 ADM/RLE (D. Minn. Oct. 23, 2002) ("Microsoft Final Judgment"). Multi-Tech also appeals from that same court's order entering final judgment of noninfringement of the '649 and '627 patents in favor of Net2Phone, Inc. Multi-Tech Sys., Inc. v. Net2Phone, Inc., No. 00-CV-1627 ADM/RLE (D. Minn. Oct. 31, 2002) ("Net2Phone Final Judgment"). Since these appeals involve the same patents, we will consider both appeals together. Because we conclude that the district court did not err in its controlling claim construction, we affirm.

BACKGROUND

Multi-Tech owns five patents directed to personal computer-based systems and methods for simultaneously transmitting voice and/or computer data to a remote site over a telephone line. All five patents derive from the same parent application, which issued as U.S. Patent 5,452,289, and share a common specification. Only three patents are at issue in this appeal: the '649 patent, the '627 patent, and the '532 patent.

The '649 patent, which is entitled "Digital Simultaneous Voice and Data Modem," is directed to methods and modules for the simultaneous transmission of voice and computer data. Claim 1 recites a method for communication of voice and data information in which outgoing computer digital data are packetized into computer data packets having headers and outgoing voice signals are received from a local user, converted into digital voice data, compressed, and packetized into voice data packets having headers. The voice and computer data packets are then multiplexed together and transmitted as an outgoing packet stream. Conversely, incoming voice and computer data packets are received, demultiplexed, and depacketized, with the incoming voice data further being decompressed and converted into remote voice signals that are

conveyed to the local user. '649 patent, col. 46, l. 56 to col. 47, l. 25. The following steps recited in claim 1 are at issue in this appeal:

> placing headers on each of the compressed outgoing digital voice packets;
> placing headers on each of the computer digital data packets;
> multiplexing the compressed outgoing digital voice data packets with outgoing computer digital data packets to produce an outgoing packet stream;
> transmitting the outgoing packet stream;
> receiving multiplexed incoming data which contains incoming computer digital data packets multiplexed with the compressed incoming digital voice data packets; and
> demultiplexing the incoming computer digital data packets and the compressed incoming digital voice data packets.

Id. at col. 47, ll. 5-25 (emphases added).

The '627 patent, which is entitled "Method and Apparatus for a Hands-Free Speaker Phone," is directed to systems and methods for transmitting packetized voice data between a local site and a remote site. Claim 1 recites:

> A communication system, comprising:
> a hands-free speaker phone operable for receiving local analog voice signals with a microphone and for playing remote analog voice signals through a speaker;
> codec means connected to the hands free speaker phone for digitizing the local analog voice signals to produce local digital voice signals and for decoding remote digital voice signals to produce remote analog voice signals;
> means for placing the local digital voice signals into outgoing packets having headers and for removing the remote digital voice signals from incoming packets having headers; and
> a modem connected to a telephone line for receiving the incoming packets from a remote site and for sending the outgoing packets to the remote site in full duplex communication mode.

'627 patent, col. 46, ll. 37-53 (emphases added). Claims 2 and 5 depend from claim 1, adding the further limitation that the "hands-free speaker phone" include a "deskset" or "headset" microphone and speaker. Id. at col. 46, l. 55 to col. 47, l. 2. Claim 7 recites a method for operating a "full-duplex speaker phone" in which analog voice signals from a

local site are received, digitized, placed into outgoing packets having headers, and then sent "to a remote site over a telephone line using a modem." At the same time, incoming voice data packets are "received through the modem from the remote site." Digital voice signals are then removed from the incoming packets and decoded to produce analog voice signals, which are played at the local site. Id. at col. 47, ll. 7-23. Similarly, claim 13 recites a method for performing "full-duplex hands-free speaker phone operation" in which outgoing voice signals are received from a local user, converted into digital voice data, compressed, packetized into voice data packets having headers, and transmitted "on a communication line using a modem." Incoming voice data packets are received "from the communication line," depacketized, decompressed, converted into analog voice signals, and conveyed to the local user. Id. at col. 48, ll. 23-47.

The '532 patent, which is entitled "Voice Over Video Communication System," is directed to a system and method for the simultaneous transmission of voice and video data. Claim 11 recites a method for "full duplex transmission of voice and video data information" in which voice signals are received from a local user, converted into digital voice data, compressed, and packetized into voice data packets. The voice data packets are then multiplexed with video data packets and transmitted as an outgoing packet stream. At the same time, incoming voice and video data packets are received and demultiplexed, with the incoming voice data packets further being depacketized, decompressed, converted into remote voice signals, and then conveyed to the local user. '532 patent, col. 48, l. 52 to col. 49, l. 13. The following steps recited in claim 11 are at issue in this appeal:

> multiplexing the compressed outgoing digital voice data packets with outgoing video data packets to produce an outgoing packet stream;
> transmitting the outgoing packet stream;

receiving multiplexed incoming data which contains incoming video data packets multiplexed with the compressed incoming digital voice data packets; and

demultiplexing the incoming video data packets and the compressed incoming digital voice data packets.

Id. at col. 49, ll. 4-13 (emphases added).

During prosecution of the '627 patent, the examiner rejected all of the pending claims under 35 U.S.C. § 103(a) as obvious over U.S. Patent 5,341,374 ("Lewen") in view of U.S. Patent 4,912,758 ("Arbel"). On May 9, 1997, Multi-Tech filed a response to that office action in which it distinguished Lewen, which discloses a local area network that integrates voice, data, and image information over a single transmission link, by arguing that the claimed voice packets "proceed directly from the communications system through the [telephone] line to a receiving communications system at the other end of the line." Multi-Tech also described its specification as disclosing "a communications system which operates over a standard telephone line[, which] establishes a point-to-point connection between telephone equipment on each end of the line." Notwithstanding Multi-Tech's arguments, the examiner again rejected the claims as obvious over Lewen in view of Arbel. On November 4, 1997, Multi-Tech amended the claims that issued as claims 1 and 13 of the '627 patent to require a modem, explaining that the claimed "voice packets are sent through a point-to-point modem connection between sites." Both of Multi-Tech's responses to the examiner's office actions were filed in the United States Patent and Trademark Office ("PTO") after the '649 patent had issued but before the '532 patent issued.[1]

On February 15, 2000, Multi-Tech filed suit against Net2Phone in the United States District Court for the District of Minnesota for infringement of the '289, '649, and

'627 patents as well as U.S. Patent 5,471,470. On June 9, 2000, Microsoft filed suit against Multi-Tech in that same court, seeking a declaratory judgment of noninfringement, invalidity, and unenforceability of seven Multi-Tech patents. Multi-Tech filed a counterclaim alleging that Microsoft infringed the '289, '470, '649, '627, and '532 patents.

In August 2002, the district court construed the disputed claim terms for the two cases in a single Markman order. Microsoft Corp. v. Multi-Tech Sys. Inc., Civil Nos. 00-1412 ADM/RLE, 00-1627 ADM/RLE (D. Minn. Aug. 16, 2002) ("Markman Order"). First and foremost, the court concluded that, for all five patents at issue, the intrinsic evidence limited Multi-Tech's inventions to use of a direct point-to-point telephone line connection. Id., slip op. at 20; see also id. at 50, 53, 55, 56. In particular, the court held that Multi-Tech had disclaimed the transmission of information through a packet-switched network,[2] such as the Internet, based on the statements that it had made during prosecution of the '627 patent. Id. at 21. Second, the court determined that the specification requires that the "headers" attached to the computer digital data packets identify the packet type and packet length and that the "headers" attached to the digital voice data packets identify whether the voice data contain silent sound or speech information. Id. at 37, 44; see also id. at 50, 52, 55. Third, the court concluded that, acting as its own lexicographer,

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[1] The '649 patent issued on February 4, 1997, and the '532 patent issued on August 4, 1998.

[2] A "circuit-switched network," such as the Public Switched Telephone Network, is one in which a connection is established from one user to the other such that the users have exclusive and full use of the circuit until the connection is released. Harry Newton, Newton's Telecom Dictionary 190-91 (5th ed. 1992). In contrast, a "packet-switched network," such as the Internet, is one in which data packets are relayed through various stations on a network. The packets comprising a message may travel along different paths and arrive at different times, but are reassembled in proper sequence at their destination. Microsoft Press Computer Dictionary 253 (1991).

Multi-Tech had defined the term "multiplexing" to be "the combining of voice data (V-data) and conventional data (C-data) for transmission through the same channel by dynamically changing the time allocations for transmission of each type of data such that V-data has higher priority over C-data, and C-data is substituted for silence packets which are detected and discarded." Id. at 40-41; see also id. at 56. Fourth, the court construed the term "hands-free speaker phone" as describing "a hardware arrangement integrated into . . . 'a sophisticated telephone apparatus with its attached handset, headset and a built-in hands-free telephone operation using the integrated microphone and speaker system.'" Id. at 47 (citation omitted). The court also ruled that the term "full-duplex speaker phone" refers to "a telephone with a speaker that allows two people to talk at the same time" and that it works in full-duplex mode through the use of voice echo cancellation. Id. at 51-52; see also id. at 54. Finally, the court construed the term "digitizing" to mean "converting analog voice signals into digital signals." Id. at 52.

Following the district court's claim construction order, Multi-Tech stipulated that Microsoft and Net2Phone did not infringe under those claim constructions. In the Microsoft case, the court granted the parties' joint motion for entry of final judgment of noninfringement of the '289, '470, '649, '627, and '532 patents pursuant to Federal Rule of Civil Procedure 54(b); the court also stayed Microsoft's claims of invalidity and unenforceability pending this court's resolution of the issues relating to claim construction and infringement. Microsoft Final Judgment, slip op. at 3. In the Net2Phone case, the district court likewise entered a final judgment of noninfringement of the '289, '470, '649, and '627 patents, but on the basis that Multi-Tech's counsel had conceded at the Markman hearing that Multi-Tech could not prove infringement literally or under the

doctrine of equivalents if the court were to rule that Multi-Tech had disclaimed transmission through a packet-switched network. Net2Phone Final Judgment, slip op. at 1-2.

Multi-Tech timely appealed to this court, challenging the judgment in the Microsoft case only with respect to the '649, '627, and '532 patents and challenging the judgment in the Net2Phone case only with respect to the '649 and '627 patents. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

DISCUSSION

The only issues on appeal relate to daim construction, as lack of infringement is conceded if we affirm on claim construction. Claim construction is a question of law, Markman v. Westview Instruments, Inc., 52 F.3d 967, 970-71 (Fed. Cir. 1995) (en banc), aff'd, 517 U.S. 370 (1996), that we review de novo, Cybor Corp. v. FAS Techs., Inc., 138 F.3d 1448, 1456 (Fed. Cir. 1998) (en banc).

A. The "Sending," "Transmitting," and "Receiving" Limitations

On appeal, Multi-Tech first challenges the district court's construction of the limitations that refer to "sending," "transmitting," and "receiving" data packets in claim 1 of the '649 patent; claims 1, 2, 5, 7, and 13 of the '627 patent; and claim 11 of the '532 patent. Multi-Tech argues that the court erred in restricting those limitations to the transmission of data packets over a direct point-to-point telephone line connection. According to Multi-Tech, the claims are directed only to the "ends" of the disclosed communications system and do not address what happens once the data packets are sent from the local user to the telephone line. Multi-Tech also argues that the specification describes a telephone line connected to a modem, which may be a direct end-to-end connection or may connect to a packet-switched network such as the

Internet. Furthermore, Multi-Tech maintains that it did not disclaim transmission through a packet-switched network during prosecution of the '627 patent because it distinguished the Lewen reference by amending claims 1 and 13 to require a modem. Multi-Tech also argues that the term "point-to-point," which it used in remarks made to the PTO during prosecution, can refer to a connection made over a packet-switched network. In any event, Multi-Tech contends, any disclaimer arising from the statements made during prosecution of the '627 patent should not be applied to the other two patents because the '649 patent issued before those statements were made and because the inventions claimed in the '649 and '532 patents are distinct from the invention claimed in the '627 patent.

Microsoft and Net2Phone respond that the claim language, particularly that of claim 7 of the '627 patent, and the specification require a direct point-to-point connection over a telephone line. They also argue that the prosecution history of the '627 patent mandates such an interpretation because Multi-Tech defined its invention as establishing a direct connection between the local and remote sites over a telephone line and argued that its claims require a "point-to-point" connection "from the communications system through the [telephone] line to a receiving communications system at the other end of the line." Finally, Microsoft and Net2Phone maintain that the prosecution history of the '627 patent is relevant to an understanding of the other two patents, which stem from the same parent application and share a common specification.

Thus, the parties' dispute over the "sending," "transmitting," and "receiving" limitations reduces to a single issue: whether those limitations are restricted to communications over a telephone line or whether they may encompass communications over a packet-switched network such as the Internet. For the reasons enumerated

below, we agree with Microsoft and Net2Phone that the district court properly construed the "sending," "transmitting," and "receiving" limitations in the '649, '627, and '532 patents as being limited to communications over a telephone line and excluding the use of a packet-switched network.

Claim interpretation begins with the claims themselves, the written description, and, if in evidence, the prosecution history. CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1366 (Fed. Cir. 2002). "Claim language generally carries the ordinary meaning of the words in their normal usage in the field of invention." Invitrogen Corp. v. Biocrest Mfg., L.P., 327 F.3d 1364, 1367 (Fed. Cir. 2003). Although it is improper to read a limitation from the specification into the claims, Comark Communications, Inc. v. Harris Corp., 156 F.3d 1182, 1186 (Fed. Cir. 1998), "[c]laims must be read in view of the specification, of which they are a part," Markman, 52 F.3d at 979; see also United States v. Adams, 383 U.S. 39, 49 (1966) ("[C]laims are to be construed in the light of the specifications and both are to be read with a view to ascertaining the invention."); Slimfold Mfg. Co. v. Kinkead Indus., Inc., 810 F.2d 1113, 1116 (Fed. Cir. 1987) ("Claims are not interpreted in a vacuum, but are part of and are read in light of the specification."). Indeed, "[o]ne purpose for examining the specification is to determine if the patentee has limited the scope of the claims." Watts v. XL Sys., Inc., 232 F.3d 877, 882 (Fed. Cir. 2000). When the specification "makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification, might be considered broad enough to encompass the feature in question." SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 1341 (Fed. Cir. 2001). A patentee may also limit the scope of the claims by disclaiming a

particular interpretation during prosecution. Biodex Corp. v. Loredan Biomed., Inc., 946 F.2d 850, 862 (Fed. Cir. 1991).

We thus begin our analysis with the claim language itself. Claim 1 of the '627 patent recites "a modem connected to a telephone line for receiving incoming packets from a remote site and for sending the outgoing packets to the remote site in full duplex communication mode." '627 patent, col. 46, ll. 50-53. Claim 7 of the '627 patent requires "sending the outgoing packets to a remote site over a telephone line using a modem" and "receiving incoming packets through the modem from the remote site." Id. at col. 47, ll. 15-18. Similarly, claim 13 of the '627 patent recites "transmitting the compressed outgoing digital voice packets on a communication line using a modem" and "receiving the compressed incoming digital voice data packets from the communication line." Id. at col. 48, ll. 44-47. Claim 1 of the '649 patent and claim 11 of the '532 patent recite "transmitting the outgoing packet stream" and "receiving multiplexed incoming data." '649 patent, col. 47, ll. 18-19; '532 patent, col. 49, ll. 7-8.

From the plain language of those claims, only claim 7 of the '627 patent explicitly states that the transmission of data packets between the local site and the remote site must occur "over a telephone line." Claim 1 of the '627 patent similarly refers to a telephone line, but is more ambiguous in that it refers to the modem connection rather than the data transmission. And the language of claim 13 of the '627 patent, claim 1 of the '649 patent, and claim 11 of the '532 patent is even more broad. It makes no reference to a telephone line and standing alone does not exclude data transmission over a packet-switched network.[3]

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[3] We reject Microsoft's contention that the "full duplex" language of claim 1 of the '627 patent and claim 11 of the '532 patent requires a direct telephone line connection. "Full duplex" operation means that the data packets can be transmitted

Nonetheless, the claims must be interpreted in light of the specification, which is identical for all three patents and which repeatedly and consistently describes the local and remote systems of the claimed inventions as communicating directly over a telephone line. The "Summary of the Invention" portion of the specification states that the claimed personal communications system includes "hardware to enable voice, fax and data communications with a remote site connected through a standard telephone line," '289 patent, col. 1, ll. 48-50,[4] as well as circuitry to "transfer [data] over the telephone lines to a remote site," id. at col. 2, ll. 49-50. The specification further discloses that the hardware components of the local system "communicate over a standard telephone line . . . to one of a variety of remote sites." Id. at col. 5, ll. 63-64. It then describes various preferred embodiments of the invention, in all of which the hardware components of the local system "communicat[e] over a standard telephone line" to the disclosed hardware components, a facsimile machine, a modem, or a standard telephone at the remote site. Id. at col. 5, l. 64 to col. 6, l. 7; id. at fig. 1. The specification also discloses that the system "allows the user to connect to remote locations equipped with a similar system or with modems, facsimile machines or standard telephones over a single analog telephone line." Id. at col. 6, ll. 36-39.

Those statements, some of which are found in the "Summary of the Invention" portion of the specification, are not limited to describing a preferred embodiment, but more broadly describe the overall inventions of all three patents. Indeed, they characterize the entire "personal communications system" as enabling communications

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simultaneously in both directions; it does not require that the data packets travel along the exact same path in both directions. See Microsoft Press Computer Dictionary 119 (1991).

between a local site and a remote site over a telephone line. Moreover, those descriptions of the claimed inventions are by no means limited to just the "ends" of the communications system as Multi-Tech argues. On the contrary, they explain that data packets from a local site are transferred "over" or "through" a telephone line "to a remote site," making clear that the communications link between the local and remote systems is a telephone line. In fact, the specification refers to data transmission "over" or "through" a telephone line roughly two dozen times. Nowhere does it even suggest the use of a packet-switched network. In light of those clear statements in the specification that the invention ("the present system") is directed to communications "over a standard telephone line," we cannot read the claims of the '627 patent, the '649 patent, or the '532 patent to encompass data transmission over a packet-switched network such as the Internet. Instead, the specification shared by all three patents leads to the "inescapable conclusion" that the communications between the local and remote sites of the claimed inventions must occur directly over a telephone line. See SciMed Life Sys., 242 F.3d at 1342 (concluding that the common specification of three patents led to the "inescapable conclusion" that their claims required coaxial lumens, even though the claim language itself was not so limited); see also Alloc, Inc. v. Int'l Trade Comm'n, 343 F.3d 1361, 1370 (Fed. Cir. 2003) (concluding that, read as whole, the common specification of three patents led to the "inescapable conclusion" that the claimed inventions must include "play" in every embodiment, even though the claim language was not so limited). Accordingly, we construe the "sending," "transmitting," and "receiving" limitations of the '627, '649, and

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[4] For ease of reference, we cite only the specification of the parent '289 patent, although the same statements are also found in the identical specifications of the '649, '627, and '532 patents.

'532 patents to require that the claimed data packets travel directly from a local site to a remote site (and vice versa) over a telephone line and not a packet-switched network.

Furthermore, an examination of the '627 patent's prosecution history confirms that Multi-Tech viewed its inventions as being limited to communications over a telephone line. In response to the examiner's first office action, Multi-Tech took the opportunity to provide a "summary of the invention" before addressing the § 103 rejection. It stated:

> In their specification, Applicants disclose a communications system which operates over a standard telephone line. Such a telephone line is commonly referred to in the art as a "plain old telephone service" (POTS) line and establishes a point-to-point connection between telephone equipment on each end of the line. Applicants' invention . . . transmits the packets across a POTS line to a remote site . . . .

(citations omitted). That statement, which expressly related to the specification shared by all three patents and the communications system disclosed in all three patents, makes clear that Multi-Tech viewed the local and remote sites of its inventions as communicating directly over a telephone line. Again, it does not describe just the connection at the "ends" of the claimed communications system, but explicitly states that the data packets travel "across a [telephone] line to a remote site" and further describes that path as being a "point-to-point" connection "between" each end. That statement unambiguously reflects Multi-Tech's own understanding of its inventions in the '627, '649, and '532 patents as being limited to the transmission of data packets over a telephone line. We cannot construe the claims to cover subject matter broader than that which the patentee itself regarded as comprising its inventions and represented to the PTO.[5]

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[5] During prosecution of the '627 patent, Multi-Tech went on to distinguish Lewen, which discloses the use of a token-ring local area network ("LAN") to transmit voice, data, and image information, by explaining that "[i]n contrast, Applicants' voice packets do not circulate around a LAN but proceed directly from the communications system through the [telephone] line to a receiving communications system at the other end of the line." (emphasis added). Multi-Tech further distinguished the Arbel reference

Moreover, although Multi-Tech made the above-quoted statement during prosecution of the '627 patent, it is also applicable to both the '649 and the '532 patents. In the past, we have held that the prosecution history of one patent is relevant to an understanding of the scope of a common term in a second patent stemming from the same parent application. E.g., Jonsson v. Stanley Works, 903 F.2d 812, 818 (Fed. Cir. 1990); see also Laitram Corp. v. Morehouse Indus., Inc., 143 F.3d 1456, 1460 n.2 (Fed. Cir. 1998) (applying the prosecution histories of two sibling patents, which shared a common written description, to one another). We likewise believe that Multi-Tech's statement made during prosecution of the '627 patent is relevant to an understanding of the common disclosure in the sibling '649 and '532 patents. Multi-Tech's statement was expressly directed to the "communications system" disclosed "[i]n the[] specification." That communications system encompasses the inventions of all three patents, see '289 patent, col. 1, ll. 35-37 (stating that the "communications system . . . contains multiple inventions"), and as noted above, the specification is identical for all three patents. Multi-Tech's statement to the PTO was thus not limited to the invention disclosed in the '627 patent, but was a representation of its own understanding of the inventions disclosed in all three patents. We therefore conclude that that statement from the '627 patent's prosecution history is pertinent to an interpretation of the later issued '532 patent. See

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on the basis that it does not disclose the transmission of packetized voice data "across" or "over" a POTS line. Those statements add further credence to our claim interpretation. However, because they refer more specifically to the references cited against the claims of the '627 patent only, we limit their relevance to our interpretation of the '627 patent.

Moreover, the prosecution history statements that we rely on were made by Multi-Tech in May 1997 and relate to the communications system disclosed in the common specification. We do not, as the dissent suggests, rely on the November 1997 "modem" amendment, which applies only to the '627 patent.

Elkay Mfg. Co. v. Ebco Mfg. Co., 192 F.3d 973, 980 (Fed. Cir. 1999) (applying the prosecution history of one patent to a related, subsequently issued patent).

Furthermore, even though the '649 patent had already issued, we think that it is not unsound to apply the same interpretation to that patent. We take the patentee at its word and will not construe the scope of the '649 patent's claims more broadly than the patentee itself clearly envisioned. We also reject Multi-Tech's argument, based on Georgia-Pacific Corp. v. United States Gypsum Co., 195 F.3d 1322, 1333 (Fed. Cir. 1999), that the statements made during prosecution of the '627 patent should not be applied to the '649 patent because the examiner could not have relied on those statements in allowing the claims of the '649 patent. We have stated on numerous occasions that a patentee's statements during prosecution, whether relied on by the examiner or not, are relevant to claim interpretation. Laitram Corp., 143 F.3d at 1462 ("The fact that an examiner placed no reliance on an applicant's statement distinguishing prior art does not mean that the statement is inconsequential for purposes of claim construction."); E.I. Du Pont de Nemours & Co. v. Phillips Petroleum Co., 849 F.2d 1430, 1438 (Fed. Cir. 1988) ("Regardless of the examiner's motives, arguments made during prosecution shed light on what the applicant meant by its various terms."). Georgia-Pacific is not to the contrary. In that case, we rejected the argument that the patentee was "bound by" statements made by the applicant in connection with a later application after the patent in suit had already issued. Ga.-Pac. Corp., 195 F.3d at 1333. The accused infringer argued that the patentee was foreclosed by the later statement from arguing in favor of a broader construction of the earlier patent, even though intrinsic evidence supported that broader construction. We rejected the argument that the patentee was bound, or estopped, by a statement made in connection with a later

application on which the examiner of the first application could not have relied. We did not suggest, however, that such a statement of the patentee as to the scope of the disclosed invention would be irrelevant. Any statement of the patentee in the prosecution of a related application as to the scope of the invention would be relevant to claim construction, and the relevance of the statement made in this instance is enhanced by the fact that it was made in an official proceeding in which the patentee had every incentive to exercise care in characterizing the scope of its invention. Accordingly, we conclude that Multi-Tech's statements made during the prosecution of the '627 patent with regard to the scope of its inventions as disclosed in the common specification are relevant not only to the '627 and '532 patents, but also to the earlier issued '649 patent.

In sum, based on our analysis of the claim language, the specification, and the prosecution history, we conclude that the district court properly interpreted the "sending," "transmitting," and "receiving" limitations of the '627, '649, and '532 patents as requiring the direct transmission of data packets between the local and remote sites over a telephone line and excluding the use of a packet-switched network such as the Internet. This conclusion in and of itself leads to our affirmance of the district court's decisions. However, inasmuch as other issues of claim construction were decided by the district court and argued before us, we consider it to be in the interest of judicial efficiency, as well as in the interest of any future litigation concerning these patents, to review the other contested claim limitations.[6]

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[6] Net2Phone has not responded to Multi-Tech's arguments regarding the remaining claim terms because the district court's final judgment of noninfringement in the Net2Phone case was based solely on the court's interpretation of the "sending," "transmitting," and "receiving" limitations. However, because the final judgment of noninfringement in the Microsoft case was based on the court's claim construction in its entirety and not just its interpretation of particular limitations, we will review all of the disputed claim terms that Multi-Tech has appealed.

B. "Multiplexing"

Multi-Tech next challenges the district court's construction of the claim term "multiplexing" in claim 1 of the '649 patent and claim 11 of the '532 patent. Multi-Tech argues that the court improperly imported limitations from the specification into the claims by requiring that voice data have priority over computer data and that computer data be substituted for detected and discarded silence packets.

Microsoft responds by pointing out that the parties agreed that Multi-Tech acted as its own lexicographer in defining the term "multiplexing." Therefore, Microsoft argues, the specification's definition of the term "multiplexing" to include the prioritization of voice packets, the detection and discarding of silence packets, and the transmission of computer data during periods of silence is the proper one.

We again begin our analysis with the claim language. Claim 1 of the '649 patent simply requires "multiplexing" outgoing voice and computer data packets and "demultiplexing" incoming voice and computer data packets. '649 patent, col. 47, ll. 14-25. Claim 11 of the '532 patent similarly requires "multiplexing" and "demultiplexing" voice and video data packets. '532 patent, col. 49, ll. 4-13. At the very least then, the plain language of the claims defines the term "multiplexing" as the combining of voice and computer data packets. The parties also agree that Multi-Tech acted as its own lexicographer in defining the term "multiplexing" to mean "dynamic multiplexing," or the combining of voice and computer data packets for transmission through the same channel by dynamically changing the time allocations for transmission of each type of data. That interpretation is supported by the specification. See, e.g., '289 patent, col. 3, l. 2; id. at col. 7, ll. 39-42.

The parties disagree, however, as to the propriety of the district court's inclusion of two additional limitations in its interpretation of the term "multiplexing." First, we agree with Microsoft that the court properly interpreted the term "multiplexing" to require the prioritization of voice data over computer data. In its discussion of multiplexing, the specification provides that voice data have higher priority than computer data "to ensure the integrity of the real-time voice transmission." Id. at col. 35, ll. 57-58. Because maintaining the integrity of the voice data is central to the functioning of the claimed inventions, we read Multi-Tech as having defined the term "multiplexing" to require the prioritization of voice data over computer data.

However, we agree with Multi-Tech that the court improperly construed the term "multiplexing" to require the detection and discarding of silence packets and the transmission of computer data packets during periods of silence. The specification's references to those limitations are nothing more than disclosures of a preferred embodiment. Although those features may be desirable, nowhere does the specification indicate that they are necessary for the multiplexing function. Moreover, the method of detecting and discarding silence packets and transmitting only computer data packets during periods of silence is separately claimed in the dependent claims. '649 patent, col. 47, ll. 26-35; '532 patent, col. 49, ll. 14-23; see Comark Communications, 156 F.3d at 1187 (recognizing that the doctrine of claim differentiation, although not a hard and fast rule of claim construction, creates a presumption that each claim in a patent has a different scope). We therefore conclude that the term "multiplexing" does not include the limitations of detecting and discarding silence packets and transmitting computer data packets during periods of silence.

C. "Headers"

Multi-Tech also argues that the district court erred in its construction of the term "headers" in claim 1 of the '649 patent and claims 1, 2, 5, 7, and 13 of the '627 patent. Multi-Tech maintains that the term "headers" should be given its ordinary meaning of "information structures that precede units of data, such as packets." Multi-Tech thus asserts that the headers attached to computer data packets need not identify packet type or packet length and that the headers attached to voice data packets need not identify whether the packets contain speech or silence. According to Multi-Tech, the district court improperly imported those additional limitations from the specification's preferred embodiments into the claims, despite the broader claim language.

Microsoft responds that the term "headers" has several ordinary meanings and that Multi-Tech's proposed definition is inconsistent with the specification's preferred embodiment and various dictionary definitions. Microsoft also argues that the specification requires both that the computer data packet headers identify packet type and packet length and that voice data packet headers indicate whether the packets contain speech or silence.

We agree with Multi-Tech that the district court's interpretation of the term "headers" was overly narrow. Claim 1 of the '649 patent refers to "placing headers" on the voice data packets as well as "placing headers" on the computer data packets. '649 patent, col. 47, ll. 5-13. Claims 1 and 7 of the '627 patent simply refer to voice data packets "having headers," '627 patent, col. 46, ll. 47-49; id. at col. 47, l. 14, while claim 13 recites "placing headers" on outgoing voice data packets, id. at col. 48, l. 39. We therefore start from the presumption that the term "headers" carries its ordinary meaning of "information structure[s] that precede[] and identif[y] the information that follows." Microsoft Computer Dictionary 215 (4th ed. 1999).

Considering both the claim language and the specification, we next conclude that the claimed "headers," at least in the '649 patent, must identify whether the packets are voice or computer data packets.[7] To begin with, the claim language of the '649 patent separately refers to "placing headers" on voice data packets and "placing headers" on computer data packets. Moreover, the specification states that "[t]he voice data packet information . . . uses a different header format [than does the computer data packet information] so the receiving site recognizes the difference between a data packet and a voice packet." '289 patent, col. 13, ll. 17-20. Such differentiation is necessary to enable the prioritization of voice data packets over computer data packets that, as discussed above, must occur when the two types of packets are multiplexed together. We therefore read the claim language, in light of the specification, as requiring that the "headers" of the '649 patent identify whether the following packets contain voice or computer data.

We further conclude, however, that the claimed "headers" need not identify the computer data packets' type and length or whether the voice data packets contain speech or silence. To be sure, the specification does disclose a preferred embodiment in which the computer data packets begin with an "ID byte" specifying the type and length of the packet, id. at col. 20, ll. 36-43 & tbls. 3-5, and the voice data packets have a "sign byte" specifying whether the packet contains silent sound or speech information, id. at col. 34, l. 64 to col. 35, l. 2 & tbl. 15. The district court determined that such additional limitations must be read into the claims because they are necessary "[f]or the

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[7] In the '627 patent, the claimed "headers" need not distinguish between voice data packets and computer data packets because that patent involves only voice data packets.

preferred embodiment to function as specified." Markman Order, slip op. at 37.[8] However, those statements are limited to descriptions of the "packet protocol" used in the preferred embodiments, see '289 patent, col. 18, l. 13; id. at col. 33, l. 61, and are merely illustrative of how the headers can be configured. We therefore conclude that the claimed "headers" need not identify the computer data packets' type and length or whether the voice data packets contain speech or silence.

D. The "Speaker Phone" Limitations

Multi-Tech next argues that the district court erred in its interpretation of the terms "hands-free speaker phone," "full-duplex speaker phone," and "full-duplex hands-free speaker phone" in claims 1, 2, 5, 7, and 13 of the '627 patent. Multi-Tech maintains that the court erred in limiting the "speaker phone" limitations to traditional speaker phones because the claim language discloses a speaker phone that is simply a microphone and a speaker, regardless of its physical housing. Multi-Tech further argues that the court improperly construed the "full-duplex speaker phone" limitations to require echo cancellation, an optional feature disclosed in the specification.

Microsoft responds that, according to its ordinary meaning, the term "speaker phone" must include structure beyond just a microphone and a speaker in order to be a telephone. Microsoft also argues that the term "full-duplex speaker phone" must include echo cancellation because the specification states that the use of a microphone and a speaker "necessitates the use of an acoustical echo cancellation algorithm to prevent feedback from destroying the voice signals."

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[8] Our broader interpretation of the term "headers" does not exclude the use of the headers disclosed in the preferred embodiment; it simply does not require their use.

We agree with Multi-Tech that the district court construed the "speaker phone" limitations too narrowly. Neither the claims nor the specification describes any physical housing that must comprise the "hands-free speaker phone." Claim 1 of the '627 patent simply recites a "hands-free speaker phone" with a microphone and a speaker. '627 patent, col. 46, ll. 37-39. Dependent claims 2 and 5 further require that the "hands-free speaker phone" include, respectively, a "deskset microphone" and a "deskset speaker," id. at col. 46, ll. 55-57, or a "headset microphone" and a "headset speaker," id. at col. 46, l. 66 to col. 47, l. 1. Claim 7 recites a "full-duplex speaker phone," id. at col. 47, l. 7, and claim 13 recites a "full-duplex hands-free speaker phone," id. at col. 48, ll. 22-23. Moreover, the specification repeatedly refers to three alternative telephone interfaces: a handset, a headset, and a hands-free microphone and speaker. E.g., '289 patent, col. 8, ll. 20-21 & fig. 3. It consistently describes the hands-free interface as simply a microphone and a speaker. To require more structure would impermissibly exclude a preferred embodiment from the claim limitation. Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1583 (Fed. Cir. 1996) (stating that it is "rarely, if ever, correct" to interpret a claim to exclude a preferred embodiment). We therefore conclude that the term "speaker phone" requires no physical structure beyond a microphone and a speaker.

We agree with Microsoft, however, that the district court properly construed the "speaker phone" limitations to require the use of echo cancellation. Although the language of the independent claims does not expressly refer to echo cancellation, the specification provides that the "use of the speaker and microphone necessitates the use of an acoustical echo cancellation algorithm to prevent feedback from destroying the voice signals" and that "a line echo cancellation algorithm is needed no matter which telephone interface . . . is used." '289 patent, col. 31, l. 67 to col. 32, l. 4 (emphases

added). Those statements clearly mandate the use of acoustical and line echo cancellation. We therefore conclude that the "speaker phone" limitations require the use of echo cancellation.

E. "Digitizing"

Multi-Tech finally argues that the district court improperly construed the term "digitizing," found in claim 7 of the '627 patent, as necessarily being performed by the codec circuit that is disclosed in the specification's preferred embodiment. Microsoft responds that the court did not interpret the term "digitizing" as necessarily being performed by the codec circuit. Thus, there is no dispute regarding this term, and we affirm the district court's construction of the term "digitizing" as meaning simply "converting analog signals into digital signals."

CONCLUSION

For the foregoing reasons, we conclude that the district court properly construed the asserted claims of the '649, '627, and '532 patents to be limited to communications over a telephone line and to exclude communications over a packet-switched network such as the Internet. However, we revise the court's constructions of the limitations relating to "headers," "multiplexing," and "speaker phone[s]." Nonetheless, because Multi-Tech's stipulations of noninfringement under the affirmed claim construction are unaffected by our changes to other aspects of the district court's claim construction, the final judgments of the district court are

AFFIRMED.

United States Court of Appeals for the Federal Circuit

03-1138

MICROSOFT CORPORATION,

Plaintiff-Appellee,

v.

MULTI-TECH SYSTEMS, INC.,

Defendant-Appellant.

03-1139

MULTI-TECH SYSTEMS, INC.,

Plaintiff-Appellant,

v.

NET2PHONE, INC.,

Defendant-Appellee.

RADER, Circuit Judge, dissenting.

This court today concludes that the invention claimed in any patent sharing the specification of the '649, '627, and '532 patents cannot encompass the use of a packet-switched communications network like the Internet. As all parties agree, the claim language in no way rules out the use of a packet-switched network. The specification also does not foreclose use of the Internet. The prosecution history of the '627 patent falls far short of a "clear and unambiguous" disclaimer of Internet coverage (as the majority finds), but rather suggests the contrary conclusion. Finally, this court today dismisses the rule in Georgia-Pacific Corp. v. United Gypsum Co., 195 F.3d 1322 (Fed.

Cir. 1999) and applies the prosecution history of a later patent to limit the narrower claims of a patent issuing before such statements were made. For these reasons, I must respectfully dissent.

This court today asserts that the language in the specification regarding "over" and "through" a telephone line somehow requires the claims to cover only those communication networks where nothing but a telephone line lies between the two end sites. To my eyes, that leap in logic is akin to Evel Knievel jumping the Snake River Gorge on a motorcycle. Like Mr. Knievel, this court's conclusion falls short. In the first place, this limitation does not appear anywhere in the claims. In addition, nothing in this record indicates that a person of skill in this art would find that limitation in the specification.

When I connect to the Internet (a packet-switched network) at home using my modem, I do it "over a telephone line." When I send email to my colleagues from home, I do it "through a telephone line" as well as across the Internet. If I travel over the river and through the woods to grandmother's house, this court would apparently conclude that I have traveled through nothing but rivers and woods. The terms "over" and "through" do not denote the sole medium of transmission or travel. If a person asks me to send them a file "over" the Internet, that request certainly would not preclude the use of a telephone line connected to a modem connected to the Internet. In sending the file, I would be sending data over my telephone line as well as over the Internet. The record contains no evidence to support the leap that "over a telephone line" must mean exclusively over a telephone line.

Most of the claims at issue never refer to the communication network between the end sites of the system. The claims focus on the "ends" of the communication system.

The "middle" portion is essentially irrelevant to the invention. Claim 1 of the '532 patent is a method claim directed to "multiplexing," "transmitting," "receiving," and "demultiplexing" voice and video data. Claim 1 of the '649 patent identifies a method that places headers on outgoing voice and computer data packets, and then multiplexes, transmits, receives, and demultiplexes the data packets. These claims address what happens at each end of the communication system, not the travel routes for the packets between the ends.

This court today, however, goes beyond merely importing a limitation from the specification into the claims. First the court manufactures an unreasonable limitation out of vague specification references to "over" and "through." Then the court imports that unstated limitation into the claims. At most, the specification can be read to require that all of the claims require the use of a telephone line in the transmitting, sending, or receiving elements. To my eyes, this court leaps into thin air when it says that the claims require the exclusive use of telephone line transmission.

To bolster the absence of limitation in the claims or specification, the court stretches to find a clear and unambiguous disclaimer in the prosecution history of the '627 patent. To the contrary, the examiner, who actually participated in that history, considered the applicant's statements regarding the '627 patent and found that the claims do not limit themselves to a standard telephone line. In fact, because the claims encompassed more than a mere telephone connection, the examiner renewed a rejection. In response to the examiner's rejection in light of the Lewen reference, the applicant stated that Lewen operates using a "local area network (LAN)" requiring the data packets to "circulate around the LAN until reaching either the gateway or the node" where they can be sent to a remote site. The applicant explained that the '627 patent

claims a system that does not use a LAN, but "operates over a standard telephone line . . . and establishes a point-to-point connection between . . . each end of the line."

The examiner responded by renewing the rejection and explaining that "the claims do not recite a limitation of a POTS telephone connection" and that "Lewen's token ring transmission medium is a telephone line in the sense that it carries voice between telephones [] separated by some distance." Thus, the examiner did not limit the invention to an exclusive telephone line connection. The examiner even considered the LAN in Lewen to satisfy the telephone connection proposed by the applicant. The LAN in Lewen connects to a packet-switched network.

Ultimately, the applicant amended the '627 claims to include the limitation of a modem. At that point, the PTO allowed the claims. The entire discussion in this prosecution history focused on the structure at each end of the communication system, not the middle medium of transmission. The applicant unambiguously disclaimed the use of a LAN and any system that does not connect modems at each end site. Neither the applicant nor the PTO, however, considered that disclaimer to extend to the use of a packet-switched network between sites. How can such circumstances show a clear and unambiguous disclaimer?

Rather than disclaiming connection to the Internet, the prosecution history more convincingly suggests that the inventor and the PTO saw these inventions as directly relevant to the Internet. The applicant eventually added the term "modem" to the '627 patent claims in order to distinguish the LAN in the Lewen reference. At the time of this amendment, a modem was the common and accepted way to connect to the Internet over a standard telephone line. U.S. Patent No. 5,594,490, which issued January 4, 1997, states: "Modem 45 communicates with a corresponding modem 17 at distribution

station 3 via a conventional point-to-point land-link such as a public switched telephone network (PSTN) or internet." Col. 9, ll. 47-56 (emphasis added). Contrary to this court's conclusion, a person of ordinary skill in the art at the time of invention would consider the addition of a modem as a clear indication that the inventor intended to connect the invention to packet-switched networks, such as the Internet. Even though modems connect to the Internet, as even the examiner acknowledged, this court emphasizes the "point-to-point" phrases in the prosecution history to exclude the Internet. This conclusion leaps to assume that the Internet does not allow point-to-point connections. The record, however, indicates exactly the opposite. As cited above, U.S. Patent No. 5,594,490 describes a point-to-point connection using the Internet. Moreover, according to Microsoft's Computer Dictionary of 1997, Third Edition, a point-to-point communication protocol is "[a] data link protocol developed . . . in 1991 for dial-up telephone connections, such as between a computer and the Internet." Thus, within the context of this art, and at the time of the amendment, the term point-to-point referred to a variety of communication networks, including the Internet.

As a question of law, however, this court's conclusion significantly erodes the requirement that a disclaimer of subject matter must be clear and unambiguous. See, e.g., Schwing GmbH v. Putzmeister Aktiengesellschaft, 305 F.3d 1318, 1324-25 (Fed. Cir. 2002) ("Prosecution history . . . cannot be used to limit the scope of a claim unless the applicant took a position before the PTO that would lead a competitor to believe that the applicant had disavowed coverage of the relevant subject matter.") This record – the examiner's responses and understanding, the definitions of "point to point" in the patents and the art, and more – do not show clarity and a lack of ambiguity, to say the least. See Omega Engineering, Inc. v. Raytek, Corp., 334 F.3d 1314, 1326 (Fed. Cir. 2003)

("To balance the importance of public notice and the right of patentees to seek broad patent coverage, we have thus consistently rejected prosecution statements too vague or ambiguous to qualify as a disavowal of claim scope.") The only subject matter unambiguously disclaimed in this case was a connection other than a modem-telephone line at each communication end.

To make this court's conclusion a longer leap, the alleged disclaimer by its terms applies only to the "modem" amendment that distinguished Lewen. Only the '627 patent's claims use the term "modem." In fact, the '627 patent was the only patent in this case rejected in light of Lewen. The '649 and '532 patents actually relied on Lewen as prior art. The examiner did not cite Lewen to reject the claims in those patents. The other patents do not even refer to a "modem." Because the inventions in the various patents are different, the '627 patent needed to distinguish Lewen while the others did not. The '649 patent claims the transmission of packetized voice and computer data. The '532 patent claims the transmission of packetized voice and video data. In contrast, the '627 patent claims only the transmission of packetized voice data. According to the PTO, the transmission of voice data only was not sufficiently narrow to avoid the Lewen reference. Thus, the applicant added the limitation of a modem connected to a standard telephone line. This simply illustrates that the broad claims of one patent, in this case the '627, may require an additional limitation to avoid prior art, while narrower claims in related patents do not need the same limitation to avoid the same prior art. The '627 amendment does not explain the reason that this court extends the limitation to narrower claims in the other patents.

By way of illustration, assume three patents (A, B, and C) share a common specification directed to a method for hanging a picture. Patent A claims an attaching

step and a leveling step. Patent B claims an attaching step and a centering step. Patent C claims only the attaching step. The prior art contains a reference to attaching pictures using nails. Because they contain limitations beyond attaching, patents A and B issue without rejection. Patent C, however, is rejected in light of the prior art. To distinguish the prior art, the applicant clarifies the attaching step is limited to using Velcro, not nails. Under what logic would a court limit the claims in Patents A and B to Velcro based on the later and inapplicable prosecution history of Patent C? That, however, is exactly what the majority does in this case.

Finally, the majority essentially disregards the holding of Georgia-Pacific. In this case, for the first time, this court applies the prosecution history of one patent to limit the claims of a related patent that was allowed before the creation of the prosecution history at issue. The '649 patent issued before the prosecution history of the '627 patent. Georgia Pacific states that for an applicant "to be bound by the statement made to the PTO in connection with a later prosecution of a different patent, the statement would have to be one that the examiner relied upon in allowing the claims in the patent at issue." 195 F.3d at 1333. In this case, the statements during the prosecution of the '627 patent could not have influenced the allowance of the '649 patent, because the '649 patent issued before those statements occurred.

In short, I cannot support this court's many leaps of illogic. I would not import the exclusive telephone line limitation, if it even exists in the specification, into the claims. Moreover, I cannot find a clear and unambiguous disclaimer in the prosecution history of the '627 patent. Even if the modem amendment in that patent disclaimed subject matter, I cannot find a justification to apply that limitation to the unambiguous claims of the '649

and '532 patents, which cover different inventions. For these reasons, I cannot join this opinion of the court.

United States Court of Customs and Patent Appeals.

In re John W. KELLER, Jr., Reese S. Terry, Jr., and Gomer L. Davies.

Appeal No. 80-573.

Feb. 12, 1981.

Applicant appealed from decision of Patent and Trademark Office Board of Appeals in reissue application serial No. 865,610 for cardiac pacer having a digital counter, rejecting all claims in application. The United States Court of Customs and Patent Appeals, Nies, J., held that: (1) Board's determination that claims in application for reissuance of Patent No. 3,557,796 for cardiac pacer having digital counter were unpatentable in view of prior art was supported by sufficient evidence; (2) declaration made to support application requesting reissuance of patent failed to properly incorporate by reference citation of prior art; and (3) passage in declaration fairly complied with requirement that applicant specify "the errors or what might be deemed to be errors relied upon, and how they arose or occurred" and requirement that applicant state that said errors, if any, arose without deceptive intention on part of applicant.

Modified.

West Headnotes

[1] **Patents** ⚿328(2)
291k328(2) Most Cited Cases
(Formerly 291k328(4))

3,557,796. Taken collectively, reference teachings of patent for transistorized, implantable cardiac pacer for regulating animal heart, patent for nonimplantable cardiac pacer for regulating a heart and patent for heart stimulater used in studies of atrioventricular conduction system of mammalian heart established prima facie case of obviousness of Patent No. 3,557,796 for cardiac pacer having digital counter, and obviousness of patent was unrebutted by affidavit of expert in cardiac pacer art, which only attacked third reference, and thus sufficient evidence supported decision of Patent and Trademark Office Board of Appeals rejecting claims in application requesting reissuance of patent. 35 U.S.C.A. § 103.

[2] **Patents** ⚿141(1)
291k141(1) Most Cited Cases

To justify combining reference teachings in support of rejection of claims in application requesting reissuance of patent, it is not necessary that device shown in one reference can be physically inserted into device shown in the other. 35 U.S.C.A. § 103.

[3] **Patents** ⚿16(3)
291k16(3) Most Cited Cases
(Formerly 291k18)

Test for obviousness of patent is not whether features of secondary reference may be bodily incorporated into structure of primary reference; nor is it that claimed invention must be expressly suggested in one or all of the references; rather, test is what combined teachings of references would have suggested to those of ordinary skill in the art. 35 U.S.C.A. § 103.

[4] **Patents** ⚿140
291k140 Most Cited Cases

Declaration made to support application requesting reissuance of patent failed to properly incorporate by reference citation of prior art, where citation was not subscribed by applicant and did not include personal declaration of applicant. Patent Office Practice Rule 175(a), 35 U.S.C.A. App.

[5] **Patents** ⚿140
291k140 Most Cited Cases

Passage in declaration in support of application requesting reissuance of patent fairly complied with requirement that applicant specify "the errors or what might be deemed to be errors relied upon, and how they arose or occurred" and requirement that applicant state that said errors, if any, arose without deceptive intention on part of applicant, where passage was remarkably close to what subsequently appeared in manual of patent examining procedure with respect to content of declaration for that purpose. Patent Office Practice Rules 175(a)(5, 6), 35 U.S.C.A. App.

Patents ⚿328(2)
291k328(2) Most Cited Cases

3,557,796. Cited.

*414 Henry D. Pahl, Jr., Boston, Mass., Gilbert H. Hennessey, Washington, D. C., for appellants.

Joseph F. Nakamura, Sol., Patent & Trademark Office, Thomas E. Lynch, Washington, D. C., of counsel.

Before MARKEY, Chief Judge, and RICH, BALDWIN, MILLER, and NIES, Judges.

NIES, Judge.

This appeal is from the decision of the Patent and Trademark Office (PTO) Board of Appeals (board) in

reissue application serial No. 865,610, filed December 29, 1977.[FN1] *415 for "Digital Counter Driven Pacer." Claims 1, 2, 6, 7, and 9-16 (all of the claims in the application) stand rejected on the ground of a defective reissue declaration, and claims 1, 2, 6, 7, 9-11, 13, and 14 are rejected on the ground of obviousness in view of the following references:

> FN1. The application requests reissuance of U.S. Patent No. 3,557,796 issued January 26, 1971, on application serial No. 805,714, filed March 10, 1969, by Cordis Corporation, the assignee. Protests were filed against the reissue application by Cardiac Pacemakers, Inc. (CPI) and by Norman H. Stepno of the firm of Bacon & Thomas pursuant to the provisions of 37 CFR 1.291. A brief amicus curiae for protestor CPI was filed in this appeal. Two cases have been filed in the United States District Courts involving appellant's '796 patent:
> (1) Cordis Corp. v. Cardiac Pacemakers, Inc. and Edward J. Luczek, United States District Court, District of Massachusetts, Civil Action No. 77-3044- F (infringement action); and
> (2) Cardiac Pacemakers, Inc. v. Cordis Corp., United States District Court, District of Minnesota, Fourth Division, Civil Action No. 4-77-427 (declaratory judgment action).

Inventor	U.S. Patent No.	Issue Date
Keller, Jr. (Keller)	3,253,596	May 31, 1966
Berkovits	3,345,990	Oct. 10, 1967

Walsh and Moore (Walsh), The American Journal of Medical Electronics, First Quarter, 1966, pages 29-34.

Claim 12 is allowable over the art of record but is objected to on the ground that the claim depends from a rejected claim. Claims 15 and 16 are allowable over the art of record.[FN2] We affirm in part and reverse in part.

> FN2. In addition to Keller, Berkovits, and Walsh, numerous other references were before the examiner. The examiner indicated in an Office Action dated May 8, 1978, however, that these other references were not any more pertinent than Keller, Berkovits, and Walsh.

Claims 1, 2, 6, 7, and 9-16 [FN3] are rejected under 35 U.S.C. s 251 on the ground that the declaration made by applicant to support the reissue application does not particularly specify the prior art being brought to the attention of the examiner as required by 37 CFR 1.175(a)(4), does not particularly specify the errors relied upon by applicant and how the errors arose as required by 37 CFR 1.175(a)(5), and does not state that the errors arose "without any deceptive intention" on the part of applicant as required by 37 CFR 1.175(a)(6).[FN4]

> FN3. Claims 1-12 were included in the reissue application as filed. By preliminary amendment claim 1 was amended and new claims 13 and 14 added. By subsequent amendment claims 3, 4, 5, and 8 were cancelled and new claims 15 and 16 added, the latter two claims reciting in independent form the same subject matter of cancelled dependent claims 5 and 8, respectively. Claims 9-12 were not amended during prosecution of the reissue application.

> FN4. 37 CFR 1.175 (1980) reads, in pertinent part:
> s 1.175 Reissue oath or declaration.
> (a) Applicants for reissue, in addition to complying with the requirements of the first sentence of s 1.65, must also file with their applications a statement under oath or declaration as follows:
> (4) When the applicant is aware of prior art or other information relevant to patentability, not previously considered by the Office, which might cause the examiner to deem the original patent wholly or partly inoperative or invalid, particularly specifying such prior art or other information and requesting that if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent.
> (5) Particularly specifying the errors or what might be deemed to be errors relied upon, and how they arose or occurred.
> (6) Stating that said errors, if any, arose "without any deceptive intention" on the part of the applicant.
> (24 FR 10332, Dec. 22, 1959, as amended at 29 FR 18503, Dec. 29, 1964; 34 FR 18857, Nov. 26, 1969; 42 FR 5594, Jan. 28, 1977)

Claims 1, 2, 6, 7, 9, 10, 11, 13, and 14 are rejected as unpatentable in view of Keller taken with Walsh. Claims 1 and 2 are further rejected as unpatentable in view of Berkovits taken with Walsh. The statutory basis of these rejections is 35 U.S.C. s 103.

The Invention

The claimed invention is a cardiac pacer having a digital counter.

As background, the specification explains:

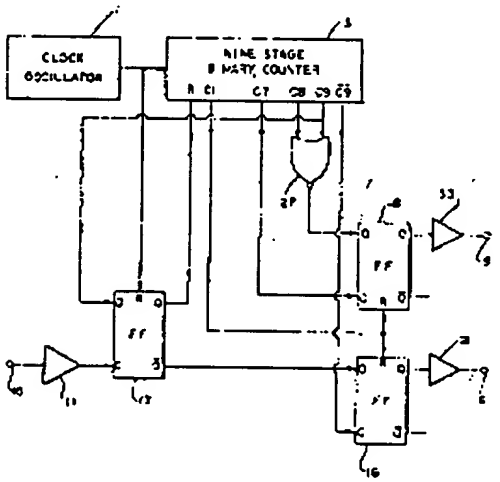
> In the normal heart, electrical signals are generated and appear in the atrium at a rate of approximately 60 to 120 times per minute, depending on such factors as body size and amount of physical exertion. Approximately 0.1 second after such a signal has appeared in the atrium, ***416** it is transferred to the ventricle of the heart, which reacts to the stimulation by contracting. This contraction forces blood from the ventricle into the arterial system and thence to the entire body. The delay between the appearance of an electrical signal in the atrium and its appearance in the ventricle is called the A-V delay. Following the contraction of the ventricle, there is an insensitive period lasting about 0.4 second, during which time the heart is unresponsive to electrical pulses. This time is referred to as the refractory delay period.
>
> A common type of heart failure is irregularity in the generation of atrial potentials. In some cases, these potentials appear at only a low rate; in others, they cease entirely for extended periods though at other times the signals may be generated with perfect regularity. It is in persons suffering from this kind of cardiac disorder that a standby or so-called demand mode pacer is used. This device is designed to apply stimulating pulses to the ventricle, by means of an electrode implanted therein, only when the heart fails to generate pulses spontaneously. When natural pulses regularly appear, the pacer provides no stimulation; when they appear irregularly, the pacer adjusts its timing to integrate its artificial pulses with the natural ones. This type of pacer is often provided with circuitry which stimulates the refractory delay period of the heart. The reason for including such delay circuitry is that a spontaneous electrical signal which appears a short time after delivery of an artificial pulse is ineffective to pump blood, either because the natural refractory period of the heart caused the heart to ignore the spontaneous pulse or because the ventricle has not had time following the previous beat to be refilled with blood. A simulated refractory period causes the pacer likewise to ignore these ineffective beats. The device's timing continues just as if the beats had never occurred.
>
> Another form of heart disease is the so-called A-V block in which the patient's heart undergoes normal or near-normal atrial contraction but the atrial signal is not transferred to the ventricle. With such a patient, it is desirable to use a so-called synchronous pacer which detects atrial signals and supplies to the ventricle a stimulating pulse about 0.1 second later, a period which constitutes a simulated A-V delay. In the absence of detected atrial signals, the pacer supplies ventricular pulses at a fixed rate. The synchronous pacer, like the demand pacer, is often provided with refractory delay simulation.

Summarizing the invention, the specification states:

> (A) cardiac pacer according to the present invention times various events and delays by means of a digital counter which is driven by an oscillator operating at a frequency which is a relatively large multiple of a normal heartbeat rate. A cardiac stimulating pulse is generated at a predetermined point in the count. Thus, if the counter cycles repetitively, the heart is stimulated at a predetermined fixed rate. To provide demand mode operation, the counter is reset in response to spontaneous cardiac signals thereby to prevent stimulation when the heart is functioning normally. To provide synchronous mode operation, the counter is reset to a point preceding the stimulation count by an amount which simulates a normal A-V delay.
>
> The use of digital count down circuitry permits both the various delays and the durations of the stimulating pulses to be accurately timed. Further, by counting down from a relatively high frequency, an oscillator having a relatively short duty cycle may be used so as to reduce battery drain. Further, the use of a relatively short oscillator period permits timing components, e. g., capacitors, of relatively small size to be used.

A block diagram of a cardiac pacer, according to the present invention, appears below:

***417**



[FF indicates D-TYPE FLIP-FLOP]

The specification indicates that if the pacer is to operate in the demand mode in a particular patient, an output electrode implanted in the patient's heart at a location suitable for stimulating ventricular contractions is connected to output terminal 6 of the pacer. If the pacer is to operate in the synchronous mode in a particular patient, an output electrode implanted in the patient's heart at a location suitable for stimulating ventricular contractions is connected to output terminal 9 of the pacer.

According to the specification, for demand mode operation an input electrode implanted to detect ventricular signals of the patient's heart is connected to input terminal 10 of the pacer. For synchronous mode operation, an input electrode implanted to detect atrium signals of the patient's heart is connected to the input terminal 10. "Cardiac signals applied to the input terminal 10 are amplified and shaped by means of an amplifier 11 so as to be squared into waveforms suitable for use with digital circuitry, as is understood by those skilled in the art."

The timing of the different events occurring in the operation of appellant's pacer is provided by a digital counter 3.

> The counter is driven by an oscillator 1 which establishes the time base. As illustrated, counter 3 comprises a nine stage binary divider and the oscillator 1 runs at a frequency which is relatively high with respect to the contemplated range of heartbeat rates or frequencies....
> As is conventional, counter 3 provides a two-stage output signal for each stage of binary division ....
> As is also conventional, the counter 3 runs cyclically, that is, the states of the binary output signals pass through a sequence which repeats after all the possible combinations have been utilized.... Further, the counter may at will be reset to a predetermined starting point by the application of a reset signal to a reset terminal, designated R. The starting point of the counter is considered herein to be the zero count and the various possible states or counts are considered to be zero through 511.[FN5]
>
> FN5. Consequently, the counter counts as follows: 0, 1, 2, 3, ..., 509, 510, 511, 0, 1, 2, ..., that is, the count changes from "511" to "0".

In describing operation of the pacer in the demand mode, the specification states that:

> ... if the patient's heart is beating normally at a rate which is more than the free running rate of the pacer, i. e. about 70 beats per minute, and not more than twice that rate, i. e. about 140 beats per minute, the counter 3 will be reset to its zero count by each natural heartbeat before a count of 511 is reached. Thus, the patient's heart will not be stimulated at all if it is beating spontaneously within this 2-to-1 range of rates. However, if no spontaneous heartbeat is detected between count 256 and count 511, the pacer will then stimulate the patient's heart at the end of the full count period, that is, after a period which corresponds to the 70 pulse per second free running rate. In other words, the difference between the starting point count and the end of the counting sequence establishes a maximum interval between heartbeats. Accordingly, if the spontaneous heart signals disappear intermittently, the pacer *418 will integrate its operation with the normal heartbeat.

In describing operation of the pacer in the synchronous mode, the specification states:

> The resetting of counter 3 is controlled in response to detected signals as described previously. Thus, the counter is reset to its zero count if an atrial signal is detected from count 256 through count 511. A stimulating pulse is then generated at output terminal 9 when count 64 is reached. The delay provided by the interval between the resetting and the 64 count is about 108 milliseconds which satisfactorily simulates the normal A-V delay. Thus the heart is stimulated with timing appropriate for synchronous pacer operation.
> If no atrial signals at all are detected, the counter 3 will run cyclically as described previously and stimulating pulses will be generated at a fixed rate, one pulse being generated each time the counter 3 passes the 64 count.

The specification describes the digital timing circuit in more detail than set forth above. The claims rejected on prior art, however, do not recite such detail. Claims 1 and 13 are illustrative:

1. Cardiac pacer apparatus comprising:
an oscillator providing a pulsating signal at a preselected frequency, which preselected frequency is a relatively large multiple of a normal heart beat rate:
a cyclically operating digital counter means for counting the pulsations of said pulsating signal;
means controlled by said counter for generating a cardiac stimulating potential when said counter reaches a predetermined count;
means for detecting a naturally occurring heart beat; and
means for setting said counter to a preselected value when a naturally occurring heart beat is detected. (Paragraphing added.)

13. Cardiac pacer apparatus comprising:
an oscillator providing a pulsating signal at a preselected frequency, which preselected frequency is a relatively large multiple of a normal heart beat rate:
a cyclically operating digital counter means for counting the pulsations of said pulsating signal;
means controlled by said counter for generating a cardiac stimulating potential when said counter reaches a predetermined count;
means for detecting cardiac signals generated during a heart beat: and
means responsive to such detected cardiac signals for setting said counter to a starting point count which precedes said predetermined count by a number corresponding to a preselected maximum interval between successive heartbeats whereby a stimulating potential is generated only if said preselected maximum interval elapses between heart beats. (Paragraphing added.)

The References
The Keller '596 Patent

Keller relates to a transistorized, implantable cardiac pacer for regulating an animal heart. The specification states that a pacer according to the Keller invention includes:

> ... sensing means responsive to a physiological heart pacing signal for producing a trigger signal, means for delaying said trigger signal for a period substantially equal to a normal atrial-ventricular delay.[FN6] a two-state free running oscillator one state of which can be terminated by the arrival of a delayed trigger signal and the other state of which is unaffected by the arrival of a signal, means responsive to the return of said oscillator to said one state for producing ventricular stimulation, whereby the minimum rate at which the pacer operates is determined by the ***419** natural period of the oscillator and the maximum rate at which said pacer can operate is determined by the natural duration of said other state, the natural durations of each of said states being independently predeterminable, and the arrival of delayed trigger signals at frequencies between said minimum and maximum synchronously controls said oscillator.
>
> FN6. According to Keller, the atrial-ventricular (A-V) delay is approximately two-tenths of a second in man, and less in smaller animals.

Identifying the elements described in the Keller patent, the examiner found the Keller pacer includes:

> a pulse generator (comprising blocking oscillator 40, stimulating pulse generator 50, and output amplifier 60);
> an analog time base circuit included in the pulse generator for generating a cardiac stimulating potential at a predetermined time (comprising transistors T5, T6);
> means for detecting cardiac signals (comprising amplifying circuit 10,20);
> reset means for setting the analog time base circuit to a starting point (comprising diode D2); and
> means for inhibiting the resetting during a preselected refractory delay period which ends at a time after the starting time but before the stimulus generating time (comprising delay circuit 30).

Appellant has not disputed these findings.

The Keller pacer can operate in a synchronous mode and in an asynchronous free-running mode. In the synchronous mode, an atrial signal is sensed, amplified, and processed, and a ventricular stimulation pulse produced and applied to the heart a predetermined time after the occurrence of the atrial signal. This predetermined time corresponds approximately to the normal A-V delay. If atrial signals are sensed to occur at a dangerously high rate, the pacer operates in the synchronous mode to produce and apply ventricular stimulation pulses at a predetermined maximum rate. If atrial signals are not sensed or are too weak for synchronization purposes, the pacer operates in the asynchronous free-running mode to produce and apply ventricular stimulation pulses at a predetermined minimum rate.[FN7]

> FN7. The minimum rate is 60 pulses per minute for a human patient.

Both the sensing of the atrial signal and the application of ventricular stimulation are accomplished by electrodes implanted in the patient's heart.

The Berkovits '990 Patent

Berkovits relates to a cardiac pacer for regulating a heart. The specification states that a pacer according to the Berkovits invention includes: means for accurately monitoring the beating action of a human heart; means for providing corrective electrical stimulation of the beating action of an abnormal heart; and means for automatically effecting such corrective heart stimulation only where required as determined by the means for monitoring the heart. The Berkovits pacer functions to "furnish stimulation to an abnormal heart in such a manner that heartbeats are individually stimulated and closely integrated with natural heartbeats."

Identifying the elements described in the Berkovits patent, the examiner found the Berkovits pacer includes:

> an analog time-base pulse generator (comprising heart stimulating means 12 and pulse generating means 18);
> means for detecting a naturally occurring heartbeat (comprising detecting means 14 and amplifying means 16); and
> means for restarting the timing period when a naturally occurring heartbeat is detected (comprising triode clipper 122).

Appellant has not disputed these findings.

The Berkovits pacer is not implantable. The monitoring means 10 includes electrocardiograph means 14 for detecting electrical signals developed by the heart during natural heartbeat action, vacuum tube amplifier means 16 for amplifying these natural heart signals, vacuum tube pulse generating means 18 responsive to the amplified signals for sending control signals to vacuum tube heart stimulating means 12, and may also include oscilloscope means 20 and audible signal means 22 for providing visual ***420** and audible indications of the occurrence of natural and stimulated heartbeats.

The heart stimulator 12 is equipped with a double-pole triple-throw switch 177 which permits manual selection of the mode of operation of the heart stimulator. Berkovitz

states:

> When the movable switch arms 178,180 (of switch 177) are set on the fixed contacts 182,184, respectively, the heart stimulator will not be operative.... (W)hen the movable arms are set on the fixed contacts 186,188, the heart stimulator is adapted to provide a continuous series of heart stimulating electrical impulses at a predetermined rate which is independent of natural heartbeats occurring at the same time.... (W)hen the movable arms are set on the fixed contacts 190,192 ... the heart stimulator is adapted to provide heart-stimulating electrical impulses only in closely integrated relation to natural heartbeats ... so that stimulated and natural heartbeats can each contribute to maintenance of a predetermined heartbeat rate.
>
> Electrodes 218 of any conventional type ... can be employed for applying a relatively large heart stimulating pulse to the patient's heart from outside the patient's body whereas the electrodes 220 can be surgically connected to the patient's heart for applying a relatively smaller electrical impulse directly to the patient's heart when desired.

Variable resistor 210 of the heart stimulating means 12 is used to selectively vary the amplitude of the heart stimulating pulse to be applied to the heart through electrodes 218 and 220.

We note that, in addition to the mode selection switch 177 and the stimulating pulse amplitude adjustment control 210 included in the heart stimulating means 12, the amplifier means 16 includes a polarity-reversing switch 32, a bias circuit switch 62, a variable voltage divider 116 which serves as a center control for the oscilloscope means 20, and a variable voltage divider 106,108 which serves as an amplifier gain control. It is apparent from the Berkovits disclosure as a whole that these switches and variable circuit elements are operator controlled.

The Walsh and Moore Article

Walsh relates to a stimulator driving unit for the controlled stimulation of the heart of a mammal. The disclosed driver includes a digital timing circuit. Walsh states:

> A digital timing system was used since it provides a higher degree of accuracy and resetability than the R-C type circuits used in conventional stimulators. In this system, a crystal-controlled, time-base generator provides a standard from which to derive the various intervals. A crystal frequency (of 0.1 megahertz) was chosen to provide a 10-u sec time base. The output of this circuit was amplified, shaped and fed to a series of six digital counting modules that make up the timing chain controlling intervals between stimuli.

The examiner found that Walsh discloses:

> ... the conventional expedient of providing a digital time base means for a medical stimulator by employing an oscillator having a frequency much higher, such (as) a relatively large multiple of the stimulation pulse frequency and counting means to produce a stimulating pulse at the desired frequency.

Appellant has not disputed these findings.

The Rejections
Reissue Declaration Rejections

The examiner rejected claims 1, 2, 6, 7, 13-16 (the claims that were either amended or added during prosecution of the reissue application) under 35 U.S.C. s 251 as based on an insufficient reissue declaration. The declaration which accompanied the reissue application reads, in pertinent part:

> I, William P. Murphy, Jr., Chairman of the Board of Directors of Cordis Corporation, declare
>
> (1.) that subsequent to the issuance of U.S. Letters Patent No. 3,557,796, applicant *421 has, in connection with the prosecution of corresponding foreign patent applications, been made aware of prior art relevant to patentability not previously considered by the Patent Office, which prior art might cause the Examiner to deem the original patent wholly or partly inoperative or invalid:
>
> (2.) that this new prior art is particularly specified in a citation of prior art accompanying this reissue application:
>
> (3.) that, to the extent the (preliminary) amendment (filed herewith) might be deemed to correct errors in the original patent, such errors arose without any deceptive intent or purpose upon the part of applicant: ...
>
> /s/ William P. Murphy, Jr.
>
> Date: Dec. 24, 1977

The "citation of prior art" referred to in the declaration and filed with the declaration reads, in pertinent part:

> The following prior art has become known to applicant subsequent to the issuance of the original Letters Patent No. 3,557,796 and is being brought to the attention of the Patent and Trademark Office for its consideration in connection with this reissue application.
>
> The references are:
>
> Copies are enclosed.
>
> /s/ (Attorney for Applicant)
>
> December 23, 1977

In making these rejections, the examiner stated that "applicants (sic) have not particularly specified all the changes in the claims (as set forth in the preliminary amendment) as the errors nor have they stated how they (the errors) arose or occurred."

The board affirmed the examiner and stated that

> the declaration fails to particularly specify the newly discovered prior art. Reference to another paper to be

filed in the application is inadequate to fulfill this requirement.

The board further indicated that the declaration not only failed to comply with 37 CFR 1.175(a)(4), but also failed to comply with 37 CFR 1.175(a)(5) and (a)(6).[FN8] Accordingly, pursuant to 37 CFR 1.196(b), [FN9] the board rejected claims 9-12 (the claims that were neither amended nor added during prosecution of the reissue application) under 35 U.S.C. s 251 as based on a declaration which does not comply with 37 CFR 1.175(a)(4), (a)(5), and (a)(6).

FN8. See note 4, supra.

FN9. 37 CFR 1.196 (1980) reads, in pertinent part:
s 1.196 Decision by the Board of Appeals.
(b) Should the Board of Appeals have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, it may include in its decision a statement to that effect with its reasons for so holding, which statement shall constitute a rejection of the claims.
(24 FR 10332, Dec. 22, 1959, as amended at 42 FR 5595, Jan. 28, 1977)

Prior Art Rejections

The examiner rejected claims 1, 2, 6, 7, 9-11, 13, and 14 as obvious in view of Keller taken with Walsh. He stated:

> The claims define over the Keller, Jr. patent in the recitation of a digital time base pulse generator. Walsh et al discloses in Figure 3 the conventional expedient of providing a digital time base means for a medical stimulator by employing an oscillator having a frequency much higher, such as a relatively large multiple of the stimulation pulse frequency and counting means to produce a stimulating pulse at the desired frequency.
> Providing an oscillator and counter-type digital time base generator for its analog equivalent in the Keller, Jr. et al device amounts to an obvious substitution to one of ordinary skill in the art after consideration of the prior art taken as a whole.

***422** The examiner further rejected claims 1 and 2 as obvious in view of Berkovits taken with Walsh. He stated that it would have been obvious in view of the teachings of Walsh to employ digital timing circuitry with a relatively high frequency oscillator in the Berkovits pacer in place of the analog timing circuitry.

Neither Keller nor Berkovits nor Walsh were cited during prosecution of the original patent application.

Rebuttal Evidence

To rebut the prima facie case of obviousness established by the examiner, appellant filed an affidavit of Jozef K. Cywinski, Ph.D. This affidavit, according to appellant, "concerns itself mainly with the question of whether the Walsh et al article suggest (sic) the use of digital timing in a cardiac pacer ...."

Dr. Cywinski, an expert in the cardiac pacer art, states in his affidavit:

> In 1967 ... I met Neil Moore (co-author of Walsh) and learned of a digital timing unit which he and Leon Walsh had built and were using for their stimulation studies.... I have been shown a 1966 article (Walsh).... I recognized the apparatus referenced therein as being that which was described to me (by Moore) in 1967 or 1968. At this time (1967-1968), I was also aware of other medical research devices employing digital counters as timing chains.
> Even before this period, it was becoming increasingly common to employ digital timing techniques in research environments. The digital approach was indicated where precise incremental timing was needed or where considerable flexibility and repeatable adjustments were needed. These characteristics are typically needed in investigatory or research projects.
> Of the various prior art laboratory timing devices employing digital counting chains, it should also be noted that these were largely operator-controlled devices....
> Although I was thus quite familiar with the use of digital timing devices as laboratory instruments, I was nonetheless impressed with the novelty of the digital cardiac pacer, being developed by Cordis, which was first described to me by John Walter Keller in about 1970 in a form of a personal communication. This pacer is described and claimed in U.S. Patent No. 3,557,796. At the time, I did not regard the approach described to me by Keller as being obvious. Rather, I believed that the approach would not have been obvious even to try since the complexity would seem to outweigh the advantages of digital timing. Further, the usual advantages, i. e., exceptional precision and incremental adjustability, were not ones which would appear to have particular utility in cardiac pacers. Rather, the simplicity of the usual analog timing circuit would seem to offer the clear advantages. I should note that I was, at that time, also familiar with the Cordis synchronous pacer which is disclosed and claimed in Keller Patent No. 3,253,596 and also the American Optical standby pacer, an earlier version of which is disclosed and claimed in Berkovits Patent No. 3,345,990.
> The Cordis pacer is a therapeutic device rather than a research tool and, further, is interactive with the spontaneous action of the patient's heart. The device disclosed in the Moore et al article does not in any similar way respond to naturally occurring heart signals nor am I aware of any other prior art device in which a digital counting chain is preset in response to a naturally occurring heartbeat. * * * The heart being stimulated (in Walsh) is an object of study, not an organism being aided

in its natural function. * * *
I do not find in the Walsh et al article any suggestion that these attributes (higher degree of accuracy and resentability when digital timing circuitry is used instead of analog timing circuitry) *423 would be advantageous in a cardiac pacer.
A cardiac pacer is implanted in the human body to monitor and control ... the heart ... to continue the life of the patient ... with no wire connections to the world outside the patient's body.
(O)ne skilled in the art at the time of the Keller et al invention would not expect that it would be either desirable or advantageous to use complicated digital circuitry. Nor would one appreciate the great advantage of the digital approach, an approach which in practice has now become recognized by the industry. (Emphasis added.)

No other rebuttal evidence was offered. The examiner did not present any additional evidence in response to the affidavit.

Board Opinion

The board unanimously affirmed the rejection of claims 1, 2, 6, 7, and 13-16 under 35 U.S.C. s 251, and entered the rejection of claims 9-12 on the same ground.

The board was divided regarding the art rejections. Two members found the affidavit insufficient to overcome the prima facie case of obviousness established by the examiner and affirmed these rejections. The majority opinion states that the affiant's statements "that he was impressed with the novelty, did not regard the approach as being obvious and believed that the approach would not have been obvious even to try ... (are) statements (of) affiant's opinion on the ultimate legal issue and, therefore, are entitled to little weight (citations omitted)."

Regarding Dr. Cywinski's factual statements about the prior art, the opinion states:
The points made by affiant are well-taken but, to a large extent not germane to the claimed subject matter or the rejections under section 103.... (The affiant) addressed himself to the intended purpose, and, undoubtedly the actual commercial purpose, of the claimed subject matter. However, the claims are not directed to a therapeutic cardiac pacer which is to be implanted into a human body to monitor and control the heart in order to continue the life of the patient. The claims are broad enough to encompass a device for use on animals in a research laboratory ....

The board held:
Keller and Berkovits both disclose cardiac pacers which function in a manner similar to the appellants' pacer using an analog timer. Walsh discloses a heart stimulator wherein a digital timer is used. The motivation for using a digital timer in place of the analog timer in the Keller and Berkovits pacers is found in Walsh where it is stated, at page 30, that digital timers provide a higher degree of accuracy as compared with analog timers.
The rejections under section 103 are predicated on replacing the analog R- C timing means in Keller and Berkovits with an equivalent digital timer: not on combining the Walsh device with the Keller or Berkovits pacer or substituting the Walsh device for the R-C timing circuit of Keller or Berkovits.... The fact that the Walsh reference makes no mention of pacing a heart or that the Walsh device does not respond to naturally occurring heart signals is immaterial. The Walsh reference is only relied on for the teaching of digital timing in an analogous environment; the other features are disclosed in Keller and Berkovits. (Emphasis added.)

The third member of the board found the affidavit sufficient to overcome the prima facie case of obviousness established by the examiner. He stated that the affiant makes "several pertinent statements which must be considered as facts because they are being made by an expert and cannot be dismissed as mere opinion." He also stated that "to say in the claims that the cardiac pacer is to be implanted in a human being to monitor and control the heart for the purpose of sustaining life would be, in my opinion, redundant."

*424 OPINION

Appellant does not argue that any features of the rejected claims other than the use of digital timing are not disclosed in Keller and Berkovits. Thus, the sole issue regarding the prior art rejections is essentially whether the references, taken collectively, would have suggested the use of digital timing in a cardiac pacer to those of ordinary skill in the art at the time the invention was made.[FN10]

FN10. Miniaturization of the physical size of the circuitry used in a cardiac pacer, the use of integrated circuit techniques in such circuitry, the elimination of hand-wired circuit interconnections in such circuitry, and so forth are not in issue. These features are not claim limitations. Moreover, appellant admits that
... integrated circuits were used in analog pacers and an integrated circuit amplifier was incorporated in the first digitally timed cardiac pacer made by Cordis Corporation .... The choice between analog timing and digital timing was thus made largely independently of the move to integrated circuits.

Appellant argues essentially three points:

(1) the teachings of Walsh cannot properly be combined with those of either Keller or Berkovits because Walsh does not relate to a cardiac pacer;
(2) if the digital timing circuitry taught by Walsh is incorporated in either the Keller pacer or the Berkovits pacer, the resulting structure would not fairly meet the claims in issue; and
(3) the board did not "accord appropriate weight to" Dr. Cywinski's affidavit, but rather "completely set aside", "disregarded", and "ignored" his statements therein.

Definition of Cardiac Pacer

The claims are directed to cardiac pacer apparatus. A cardiac pacer is defined as:

> ... a device designed to stimulate, by electrical impulse, contractions of the heart muscle at a certain rate; used in absence of normal function of the sino-atrial node; it may be connected from the outside or implanted within the body. ([FN11])
>
> FN11. Dorland's Illustrated Medical Dictionary 1080-81 (24th ed. 1965), defining "pacemaker." This definition is carried forward in the subsequent edition, Dorland's Illustrated Medical Dictionary 1117-18 (25th ed. 1974), and augmented with examples of external types and implanted types of pacers.

On its face, Keller relates to a cardiac pacer which is implanted within the body. On its face, Berkovits relates to a cardiac pacer which is not implantable within the body, but rather is connected from the outside of the patient's body. Appellant admitted below that "(b)oth the Keller '596 patent and the Berkovits '990 patent disclose cardiac pacers ...," and asserted that these patents "represent conventional thinking with respect to cardiac pacing at the time the present invention was made." Appellant admitted further that "the Keller et al and Berkovits devices are true interactive cardiac pacers ...." Thus, the term "cardiac pacer" encompasses both implantable and non-implantable devices. Therefore, the words "cardiac pacer apparatus" used in the rejected claims are broad enough to read on a device for humans which is not implanted.[FN12]

> FN12. Dr. Cywinski, who indicated that he was familiar with the pacers "disclosed and claimed" in Keller and in Berkovits, stated: "A cardiac pacer is implanted in the human body to ...." We note Dr. Cywinski did not state that a device cannot be a cardiac pacer if it is not implanted in the human body, and we further note that, based on his familiarity with the pacer disclosed and claimed in Berkovits (which is not implantable), he could not have intended his testimony to be so construed.

Walsh Relates to Analogous Art

[1] Contrary to the position advanced by appellant on appeal, Keller and Berkovits are the principal references relied on by the examiner in his rejections. [FN13] Walsh is the secondary reference. The board correctly noted that Walsh is relied on only for the teaching of digital timing in an analogous environment.

> FN13. Appellant, at page 6 of his main brief, states: "... the type described in the principal reference, the Walsh et al article."

Appellant "strongly emphasizes" that Walsh "is not about cardiac pacing"; and that the device taught by Walsh is an investigatory ***425** device used in the study of a mammalian heart rather than a therapeutic device used in the treatment of a living human (which, of course, has a mammalian heart).

Walsh discloses a heart stimulator used in studies of the atrioventricular conduction system of a mammalian heart. A stimulator used in studies of the atrioventricular conduction system of a mammalian heart is not so non-analogous to a stimulator used to pace a mammalian heart that it should be ignored. Accordingly, Walsh may be combined with either Keller or Berkovits. In re Menough, 51 CCPA 741, 323 F.2d 1011, 139 USPQ 278 (1963).

Appellant further argues that Walsh does not relate to a cardiac pacer because Walsh teaches a stimulator which is used in conjunction with an oscilloscope, and which has a multiplicity of multiple position switches that are operator controlled. As discussed above, Berkovits discloses a cardiac pacer which may be used in conjunction with an oscilloscope, and which has a multiplicity of multiple position switches as well as other variable circuit elements that are operator controlled. Thus, the argument that such features render Walsh unrelated to a cardiac pacer is without merit.

Combining Walsh with Keller or Berkovits

[2][3] To justify combining reference teachings in support of a rejection it is not necessary that a device shown in one reference can be physically inserted into the device shown in the other. In re Griver, 53 CCPA 815, 354 F.2d 377, 148 USPQ 197 (1966); In re Billingsley, 47 CCPA 1108, 279 F.2d 689, 126 USPQ 370 (1960). The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. In re Wood, 599 F.2d 1032, 202 USPQ 171

(CCPA 1979); In re Passal, 57 CCPA 1151, 426 F.2d 828, 165 USPQ 720 (1970); In re Richman, 57 CCPA 1060, 424 F.2d 1388, 165 USPQ 509 (1970); In re Rosselet, 52 CCPA 1533, 347 F.2d 847, 146 USPQ 183 (1965).

Both Keller and Berkovits disclose heart stimulators that use R-C type timing circuits. Walsh teaches the use of digital type timing circuits in place of R- C type timing circuits in conventional heart stimulators. Therefore, the question is whether it would have been obvious to one of ordinary skill in the art, working with the Keller and the Berkovits and the Walsh references before him, to do what the inventors herein have done, that is, to use a digital timing circuit in a cardiac pacer. In re Winslow, 53 CCPA 1574, 365 F.2d 1017, 151 USPQ 48 (1966), as modified by In re Antle, 58 CCPA 1382, 444 F.2d 1168, 170 USPQ 285 (1971). We agree that the references establish a prima facie case of obviousness.

The Cywinski Affidavit

Once a prima facie case of obviousness was established below, the burden shifted to appellant to rebut it, if he could, with objective evidence of non- obviousness. In re Fielder, 471 F.2d 640, 176 USPQ 300 (CCPA 1973). Appellant attempted to do so by introducing the Cywinski affidavit. Both this court and the PTO must give full consideration to that evidence and render a decision based on the relative strength of appellant's showing and the prima facie case established by the references. In re Saunders, 58 CCPA 1316, 444 F.2d 599, 170 USPQ 213 (1971).

Appellant's showing below "may well shift the burden of proof to the examiner to then come forward with further support for his conclusion that the invention would be obvious under the conditions stated in section 103." In re Katzschmann, 52 CCPA 1497, 1500, 347 F.2d 620, 622, 146 USPQ 66, 68 (1965). (Emphasis added.) Whether appellant's showing does shift the burden of proof, however, must be determined on a case by case basis.

As characterized by appellant, the Cywinski affidavit offered as objective evidence of non-obviousness "concerns itself mainly ***426** with the question of whether the Walsh et al article suggest (sic) the use of digital timing in a cardiac pacer ...." But one cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references. In re Young, 56 CCPA 757, 403 F.2d 754, 159 USPQ 725 (1968). Moreover, as set forth above, the test is not whether a suggestion to use digital timing in a cardiac pacer is found in Walsh (which was the test applied by Dr. Cywinski), but rather what Keller in view of Walsh and what Berkovits in view of Walsh would have suggested to one of ordinary skill in the art.

Contrary to the position advanced by appellant, In re Carroll, 601 F.2d 1184, 202 USPQ 571 (CCPA 1979) is not "nearly 'on fours' with the present factual situation."

In Carroll this court concluded that the opinion of an expert on what the prior art taught was deserving of considerable deference under the circumstances of that case. The expert had critically reviewed the sole piece of prior art and totally discounted its value. The accuracy of the expert's views was supported by documentary evidence.

In the present case, we are not presented with a single prior art reference, but rather two combinations of three references: Keller in view of Walsh, and Berkovits in view of Walsh. The affidavit does not indicate that Dr. Cywinski critically reviewed the use of digital timing in a cardiac pacer as prima facie established by the two combinations of references. Consequently, Dr. Cywinski's opinion on the ultimate legal question of obviousness is entitled to little weight.

Section 103 Rejections are Affirmed

The board considered Dr. Cywinski's testimony and accorded it due weight. We are satisfied that the record herein contains sufficient evidence to support the board's decision. Accordingly, we affirm the decision of the board regarding the s 103 rejections.

Requirements of Reissue Declaration

Turning to the rejections under 35 U.S.C. s 251, we note that a reissue declaration, defective in the nature alleged herein, is correctable in the PTO by the filing of a supplemental oath or declaration.

A reissue oath or declaration filed under 37 CFR 1.175 subsection (a)(4) must also comply with both subsections (a)(5) and (a)(6).[FN14] Subsection (a) of section 1.175 sets forth requirements relating to the content of a statement which must be filed by the applicant with his reissue application. Subsection (a)(4), which requires the applicant to particularly specify the prior art or other information relevant to patentability and not previously considered by the PTO, which might cause the examiner to deem the original patent wholly or partly inoperative or invalid, therefore requires the prior art or other information to be specified in that statement.

FN14. See note 4, supra.

In the present case, the reissue declaration purported to incorporate by reference a paper entitled "citation to prior art" on which the prior art being brought to the attention of the PTO by the applicant was delineated. The question before this court, therefore, is whether the citation of prior

art was successfully incorporated by reference into the declaration.

Subsection (a) of section 1.175 requires the statement to be made by the applicant under oath or declaration. This statement, therefore, (1) must be subscribed to by the applicant, and (2) must either (a) be sworn to or affirmed by the applicant as provided in 37 CFR 1.66, or (b) include the personal declaration of the applicant as prescribed in 37 CFR 1.68. See 37 CFR 1.65(a) (2).

[4] In the present case, the declaration per se was subscribed by the applicant and included an appropriate personal declaration of the applicant. The citation of prior art was not subscribed by the applicant and did not include the personal declaration of the applicant. Rather, the citation of prior art was subscribed by applicant's attorney. And, while the citation of prior art is dated *427 one day earlier than the declaration, there is no evidence in the record that applicant even saw the citation of prior art at the time the declaration was executed.

Accordingly, we affirm the decision of the board regarding the rejections of claims 1, 2, 6, 7, and 9-16 under 35 U.S.C. s 251 because the declaration does not comply with 37 CFR 1.175(a)(4).

As to the rejections on grounds relating to 37 CFR 1.175(a)(5) and (a)(6), we do not agree with the board.

Subsection (a)(5) requires the applicant to specify "the errors or what might be deemed to be errors relied upon, and how they arose or occurred." Subsection 1414.03 of the Manual of Patent Examining Procedure (MPEP) (4th ed., Rev. 1, Jan. 1980) [FN15] states that to comply with the requirements of subsection (a)(5) in a s 1.175(a)(4) type reissue, the reissue declaration

> FN15. We note that MPEP chapter 1400, the chapter dealing with reissue applications, has been completely revised in the fourth edition and now includes detailed instructions regarding, inter alia, reissue declarations.

> might state that some or all claims might be deemed to be too broad and invalid in view of references X and Y which were not of record in the patent files. Usually, a general statement will suffice. * * * (The reissue declaration) must indicate when and the manner in which the reissue applicant became aware of the prior art or other information....

MPEP s 1401.08 (3rd ed., Rev. 54, Oct. 1977) merely stated:

> The reissue oath or declaration must point out very specifically what the defects are and how the errors arose.

[5] Applicant's reissue declaration contains a passage (which we have numbered "1" in the quoted declaration) that is remarkably close to what subsequently appeared in the fourth edition of the MPEP with respect to the content of a declaration for this purpose. We hold on the facts of this case that the declaration fairly meets the requirements of 37 CFR 1.175(a)(5).

Subsection (a)(6) requires the applicant to state that said errors, if any, arose without deceptive intention on the part of the applicant. The passage in the declaration which we have numbered "3" fairly meets this requirement.

CONCLUSION

Accordingly, the decision of the board regarding the rejections of claims 1, 2, 6, 7, 9-11, 13, and 14 based on the prior art is affirmed, the decision of the board regarding the rejections of claims 1, 2, 6, 7, and 9-16 based on 37 CFR 1.175 subsection (a)(4) is affirmed, and that based on subsections (a)(5) and (a)(6) is reversed.

MODIFIED.

642 F.2d 413, 208 U.S.P.Q. 871

END OF DOCUMENT

United States Court of Appeals, Federal Circuit.

In re MERCK & CO., INC.

No. 85-2740.

Sept. 8, 1986.

Assignee of patent involving claimed invention of method of treating human depression by oral administration of amitriptyline requested reexamination of patent. The Patent and Trademark Office Board of Patent Appeals and Interferences sustained rejection of pertinent claims in the reexamination application, and assignee appealed. The Court of Appeals, Davis, Circuit Judge, held that: (1) claimed invention was prima facie obvious, and (2) alleged unexpected effects did not rebut finding of prima facie obviousness.

Affirmed.

Baldwin, Circuit Judge, filed dissenting opinion.

West Headnotes

[1] **Patents ⚖16.25**
291k16.25 Most Cited Cases
Claimed invention of method of treating human depression by oral administration of amitriptyline was prima facie obvious over prior art or record, given its structural similarity to imipramine, already used in treatment of depression; one of ordinary skill in medicinal chemical arts would have expected amitriptyline to resemble imipramine in alleviation of depression. 35 U.S.C.A. § 103.

[2] **Patents ⚖16(3)**
291k16(3) Most Cited Cases

Test for determining whether claimed invention of method of treating human depression by oral administration of amitriptyline was obvious was whether references, taken as whole, would have suggested invention to one of ordinary skill in medicinal chemical arts at time invention was made, rather than "obvious to try" standard. 35 U.S.C.A. § 103.

[3] **Patents ⚖16.25**
291k16.25 Most Cited Cases

Prior art teaching that precise structural differences between amitriptyline and imipramine involved known bioisosteric replacement, in combination with teachings that the drugs were closely structurally related and that one would expect similar structures to behave similarly, provided sufficient basis for required expectation of success, in determining that claimed invention of method of treating human depression by oral administration of amitriptyline was obvious, without resort to hindsight, where imipramine was already useful in treatment of depression. 35 U.S.C.A. § 103.

[4] **Patents ⚖16(1)**
291k16(1) Most Cited Cases

Obviousness, as basis for unpatentability, does not require absolute predictability; only reasonable expectation that beneficial result will be achieved is necessary to show obviousness. 35 U.S.C.A. § 103.

[5] **Patents ⚖16(2)**
291k16(2) Most Cited Cases

Nonobviousness, necessary for patentability, cannot be established by attacking references individually, where rejection is based upon teachings of combination of references. 35 U.S.C.A. § 103.

[6] **Patents ⚖34**
291k34 Most Cited Cases

Evidence of contemporaneous invention, in determining patentability of claimed invention of method of treating human depression by oral administration of amitriptyline, although unnecessary, was probative of level of knowledge in art and time invention was made, in determining whether claimed invention was obvious. 35 U.S.C.A. § 103.

[7] **Patents ⚖36(1)**
291k36(1) Most Cited Cases

Prima facie case of obviousness can be rebutted by evidence of unexpected result, in determining invention's patentability. 35 U.S.C.A. § 103.

[8] **Patents ⚖36(1)**
291k36(1) Most Cited Cases

Alleged unexpected properties of amitriptyline, that it had more potent sedative and stronger anticholinergic effect, were not so unexpectantly different from properties of imipramine, closest prior art, as to overcome prima facie showing of obviousness of claimed invention of method of treating human depression by oral administration of amitriptyline. 35 U.S.C.A. § 103.

Patents ⚖328(2)
291k328(2) Most Cited Cases

3,428,735. Claims Nos. 1, 2, 3. Rejected.

*1092 Charles M. Caruso of Merck & Co., Inc., Rahway, N.J., argued for appellant. With him on brief was Nels T. Lippert, of Fitzpatrick, Cella, Harper & Scinto, New York City. Of counsel were Mario A. Monaco and Michael C.

Sudol, Jr., of Merck & Co., Inc., Rahway, N.J.

Richard E. Schafer, Associate Sol., Office of Sol., Arlington, Va., argued for appellee. With him on brief were Joseph F. Nakamura, Sol., and Fred E. McKelvey, Deputy Sol.

Donald R. Dunner of Finnegan, Henderson, Farabow, Garrett & Dunner, Washington, D.C., argued for intervenor Biocraft Laboratories, Inc. With him on brief were Robert D. Bajefsky and Carol P. Einaudi of Finnegan, Henderson, Farabow, Garrett & Dunner, Washington, D.C. Of counsel was Beryl L. Snyder, of Biocraft Laboratories, Inc., Elmwood Park, N.J.

Before DAVIS, BALDWIN and ARCHER, Circuit Judges.

DAVIS, Circuit Judge.

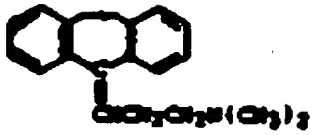
This is an appeal from a final decision of the United States Patent and Trademark Office (PTO) Board of Patent Appeals and Interferences (Board), sustaining the rejection of claims 1 through 3 in the reexamination application [FN1] of U.S. Patent No. 3,428,735 [FN2] (the '735 patent) as unpatentable under 35 U.S.C. § 103. We affirm.

> FN1. *Ex Parte Merck and Co.*, Reexamination No. 90/000264, Appeal No. 607-66 (PTO Bd.Pat.App. & Int., May 28, 1985), JA p. 7. In its opinion the Board expressly adopted the reasonings in its earlier reissue (for the '735 patent) opinions, *Ex Parte Edward L. Engelhardt*, Reissue Application No. 776,464, Appeal No. 424-40 (PTO Bd.Pat.App., Apr. 23, 1980), JA p. 13 and *Ex Parte Edward L. Engelhardt*, Reissue Application No. 776,464, Appeal No. 480-01 (PTO Bd.Pat.App., Feb. 25, 1982), JA p. 23.
>
> FN2. U.S. Patent No. 3,428,735, issued to Edward L. Engelhardt on February 18, 1969, was based on patent application Serial No. 662,907 filed August 24, 1967 as a continuation-in-part of patent application Serial No. 855,981 filed Nov. 30, 1959.

I. BACKGROUND

A. *The Invention*

The invention is directed to a method of treating human mental disorders; the method involves treating depression in humans by the oral administration of 5-(3-dimethylaminopropylidene)dibenzo[a, d][1, 4]cycloheptadiene (commonly known as and hereafter referred to as "amitriptyline"), or the hydrochloride or hydrobromide salts thereof, in a particular dosage range. Amitriptyline has the following chemical structure:



Amitriptyline

*1093 As representative of the invention, claim 1 reads:

> 1. A method of treating human mental disorders involving depression which comprises orally administering to a human affected by depression 5-(3-dimethylaminopropylidene) dibenzo[a, d][1, 4]cycloheptadiene or its non-toxic salts in daily dosage of 25 to 250 mg. of said compound.

Remaining claims 2 and 3 are dependent from claim 1 and add limitations pertaining to the use of the hydrochloride and hydrobromide salts of amitriptyline, respectively.

B. *Related Proceedings*

On March 10, 1977 an application, Serial No. 776,464 (the '464 application), was filed for reissue of the '735 patent. [FN3] All the claims of the ' 464 application were finally rejected by the examiner under section 102 of title 35, United States Code, and alternatively under section 103 of that title. Subsequently, an appeal (Appeal No. 424-40) was taken to the Board [FN4] which affirmed the examiner's rejections. Additionally, the Board entered a new rejection under 35 U.S.C. § 103 over a combination of references not previously cited by the examiner. In accordance with 37 C.F.R. § 1.196(b) (1985) [FN5], appellant elected reconsideration of the ' 464 application by the examiner. The examiner maintained the rejection entered by the Board: in Appeal No. 480-01, the Board affirmed the examiner. The Board's decision was appealed to the Court of Customs and Patent Appeals (CCPA). Upon the motion of the Commissioner of Patents and Trademarks and on the authority of *In re Dien*, 680 F.2d 151, 214 USPQ 10 (CCPA 1982), the appeal was dismissed for lack of subject matter jurisdiction. [FN6]

> FN3. The reissue application was filed as a "no defect" type reissue under the then existing 37 C.F.R. § 1.175(a)(4) (1980). That provision has now been repealed.
>
> FN4. At that time, the Board of Patent Appeals and Interferences was called the Board of Patent Appeals.
>
> FN5. 37 C.F.R. § 1.196(b) provides that when the Board of Appeals determines a new ground of rejection, the appellant may
> (1) after submitting appropriate amendments or

showing of facts, have the matter reconsidered by the examiner;
(2) waive reconsideration before the examiner and have the case reconsidered by the Board; or
(3) treat the decision, including the new ground of rejection, as a final decision in the case.

FN6. *See In the Matter of the Application of Edward L. Engelhardt,* Appeal No. 82-611 (CAFC Oct. 28, 1982) (order granting motion to dismiss).

The reissue application was protested by Biocraft Laboratories, Inc. (Biocraft), intervenor in the current appeal. Biocraft is also the plaintiff in a related litigation pending in the U.S. District Court for the District of New Jersey in which the validity and infringement of the '735 patent is in issue. *See Biocraft Laboratories Inc. v. Merck & Co.*, Civil Action No. 77- 0693 (D.N.J.). The district court has stayed further action in that case pending the final outcome of the pending PTO proceedings.

C. *Reexamination Proceeding*

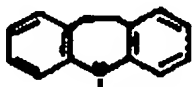
Following dismissal of the reissue appeal by the CCPA, Merck & Co., Inc. (Merck), the assignee of the '735 patent, filed for and was granted a request for reexamination of the patent. As a result of prosecution before the examiner, claims 1 through 3 of the reexamination application were finally rejected under 35 U.S.C. § 102 as anticipated by prior art references; the claims were also rejected under 35 U.S.C. § 103 as being obvious over references cited by the Board in its new ground of rejection entered during the initial reissue appeal. Finding the '735 patent to be entitled to the benefit of the November 30, 1959 filing date of its parent application, Serial No. 855,981, the Board reversed the section 102 rejection because the effective filing date of the application antedated all the references cited therein. The Board, however, sustained the rejection for obviousness under section 103. Expressly adopting the reasonings of its earlier reissue opinions, the Board took the position that in view of the prior art, in combination, ***1094** and a thorough knowledge of the investigative techniques used in the medicinal chemical art, the skilled artisan would have expected the known tricyclic compound, amitriptyline, to be useful as an antidepressant.

D. *The References*

The references relied upon by the Board were:
(1) Rey-Bellet et al. (Rey-Bellet) U.S. Patent No. 3,384,663, May 21, 1968 (application filed Mar. 27, 1959);
(2) Kuhn, *Schweizerische Medizinische Wochenschrift,* Vol. 87, No. 35-36, pp. 1135-1140 (Aug. 1957);
(3) Lehman et al. (Lehman), *Canadian Psychiatric Association Journal,* "The Treatment of Depressive Conditions with Imipramine (G 22355)", vol. 3, No. 4, pp. 155-164 (Oct. 1958);
(4) Friedman, *First Symposium On Chemical Biological Correlation,* "Influence of Isosteric Replacements Upon Biological Activity", pp. 296-358 (May 1950);
(5) Burger, *Journal of Chemical Education,* "Rational Approaches to Drug Structure", Vol. 33, No. 8, pp. 362-372 (Aug. 1956);
(6) Petersen et al. (Petersen), *Arzneimittel-Forschung,* Vol. 8, No. 7, pp. 395-397 (1958);
(7) Roche Research Report No. 43,162, pp. 1-9 (Nov. 1957);
(8) Roche Research Report No. 43,169, pp. 1-8 (Apr. 1958);
(9) Roche Research Report No. 52,195, pp. 1-13 (Sept. 1958) (collectively called the "Roche Reports").

The Rey-Bellet patent disclosed amitriptyline and its hydrochloride salt. Properties of amitriptyline taught by the reference included a "manifold activity upon the central nervous system," as well as pharmacological and medicinal properties, such as "narcosis-potentiating, adrenolytic, sedative, antihistaminic, antiemetic, antipyretic and hypothermic." Rey-Bellet did not disclose or otherwise teach that amitriptyline possessed antidepressive properties.

The Kuhn publication disclosed the compound, imipramine, and taught that the compound was a very effective antidepressant in humans. Imipramine has the chemical structure



and differs from the structure of amitriptyline only in the replacement of the unsaturated carbon atom in the center ring with a nitrogen atom. Kuhn taught a recommended dosage of 75-150 mg per day--possibly 200-250 mg if the smaller doses proved ineffective.

The Lehman publication disclosed the results of a Canadian study of the effects of imipramine on the symptoms of depression in humans. This article confirmed, for the most part, the teachings of the Kuhn article.

The object of the Friedman publication was "to survey the history of isosterism, to classify the varieties of isosteric replacements which are recorded in the literature, and to note the influence of these replacements on the biological activity of compounds." Friedman defined isosteres as atoms, ions or molecules in which the peripheral layers of electrons can be considered identical. Compounds which fit

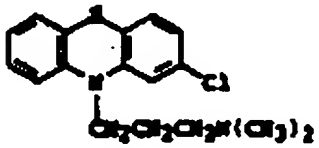
this broad definition and exhibit the same biological activity were termed "bioisosteric." Further, with respect to the medicinal chemists' use of the theory of "isosteric replacement" or "bio- isosteric replacement" as a tool to predict the properties of compounds, Friedman commented that:

> [t]o the synthetic organic chemist interested in medicinal chemistry, every physiologically active compound of known structure is a challenge--a challenge either to better it, or perhaps merely to equal it....
> There are numerous ways of attacking such a problem.... One of the methods which has been used frequently, very ***1095** often with success, is that of isosteric replacement. The examples of this type of replacement in the literature are very numerous, and the fruitful results in the fields of sulfonamides, antimetabolites, and antihistamines are well known.

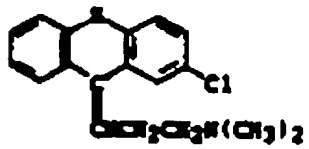
Friedman at page 296. Finally, Friedman disclosed various atoms or groups of atoms as bioisosteric, including the interchange of oxygen and the unsaturated carbon atom which often resulted in similar biological activity. Friedman, however, did not disclose or otherwise teach as bioisosteric the interchange of the nitrogen and unsaturated carbon atoms.

The Burger publication also discussed the theory of "bioisosterism" and its usefulness in designing new drugs based upon the knowledge of "lead" compounds.

The Petersen publication taught, *inter alia*, the properties of chlorpromazine (a phenothiazine derivative) and chlorprothixene (a 9-amino-alkylene- thioxanthene derivative), these compounds having the following structural formulas:



Chlorpromazine



Chlorprothixene

Petersen concluded that, when the nitrogen atom located in the central ring of the phenothiazine compound is interchanged with an unsaturated carbon atom as in the corresponding 9-amino-alkylene-thioxanthene compound, the pharmacological properties of the thioxanthene derivatives resemble very strongly the properties of the corresponding phenothiazines. Using the theory of isosteric replacement, Petersen predicted this similarity in properties:

> Structural chemical considerations permitted the expectation that the 9- aminoalkylene-thioxanthenes ... would show great similarity to the corresponding phenothiazines. They should be more similar in their behavior to that of the phenothiazines than the saturated 9-aminoalkyl-thioxanthenes. From the physical point of view the <<DblDagger>> -electron distributions (sites of <<DblDagger>> -electrons) are almost the same in the phenothiazine derivatives and in the 9-aminoalkylene-thioxanthenes with their stabilizing conjugated double linkage between C9 in the thioxanthene ring and the first C- atom of the side chain.

Petersen at page 3. The compounds were disclosed as having a strong central depressive, i.e., tranquillizing, action in animals.

The Roche Reports revealed the results from tests comparing the pharmacological properties of amitriptyline and imipramine. The reports indicated that the two compounds were very similar in a variety of properties, including their action as tranquilizers having narcosis-potentiating effects. Because of this similarity and because amitriptyline and imipramine were structurally related, Roche scientists concluded that amitriptyline should be clinically tested for depression alleviation--a known property of imipramine. In the pharmalogical guideline for the clinical testings of amitriptyline (which was labelled Roche Preparation Ro 4-1575), the Roche Reports stated that

> [i]t is to be noted that a "tofranil-like effect" is already to be expected by using a dose 1/4 - 1/2 that of Tofranil. Side effects which can appear ... are sedative and atropine-like effects, such as appear also with Tofranil. [[[FN7]]

FN7. Tofranil is a tradename used for imipramine.

We must decide in this appeal whether appellant's invention would have been prima facie obvious over the available prior art of record: and, if so obvious, whether ***1096** the prima facie case has been rebutted by evidence of unexpected results.

II. DISCUSSION

In its opinion on this problem, the Board expressly followed the guidelines of *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 86 S.Ct. 684, 693-694, 15 L.Ed.2d 545, 148 USPQ 459, 466-67 (1966), and made findings on factual inquiries specifically set forth in that decision. These factual findings must be accepted unless they are clearly erroneous. *In re Wilder*, 736 F.2d 1516, 1520, 222 USPQ 369, 372

(Fed.Cir.1984), *cert. denied*, 469 U.S. 1209, 105 S.Ct. 1173, 84 L.Ed.2d 323 (1985); *In re De Blauwe*, 736 F.2d 699, 703, 222 USPQ 191, 193 (Fed.Cir.1984); *accord Stock Pot Restaurant, Inc. v. Stockpot, Inc.*, 737 F.2d 1576, 1578-79, 222 USPQ 665, 666-67 (Fed.Cir.1984). In this case we do not hold the Board's factual findings--as to the scope and content of the prior art, the differences between the prior art and the claims at issue, and the level of ordinary skill in the art--to be clearly erroneous and accordingly we have followed them in our statement of the prior art and we now follow them in our analysis of the legal issue of obviousness.

[1] *Prima Facie Obviousness:* The prior art taught that amitriptyline and imipramine are both psychotropic drugs which react on the central nervous system and which were known in the art prior to the time of appellant's invention. Imipramine was known to possess antidepressive properties in humans. While amitriptyline was known to possess psychotropic properties such as sedative and narcosis-potentiating properties, the drug was not known to be an antidepressant. However, the prior art has shown that imipramine and amitriptyline are unquestionably closely related in structure. Both compounds are tricyclic dibenzo compounds and differ structurally only in that the nitrogen atom located in the central ring of imipramine is interchanged with an unsaturated carbon atom in the central ring of amitriptyline. To show obviousness, it was necessary to determine from knowledge already available in the art at the time of appellant's invention that one skilled in the medicinal chemical art would have expected amitriptyline, like imipramine, to be useful in the treatment of depression in humans. *In re Papesch*, 315 F.2d 381, 137 USPQ 43 (CCPA 1963).

As found by the Board, the Roche Reports recognized the structural relationship between amitriptyline and imipramine and concluded that amitriptyline should be tested for its antidepressant activities. In fact, the Roche Reports expressly stated that amitriptyline was expected to resemble imipramine clinically in its depression alleviation effects.

"Structural similarity, alone, may be sufficient to give rise to an expectation that compounds similar in structure will have similar properties." *In re Payne*, 606 F.2d 303, 313, 203 USPQ 245, 254 (CCPA 1979). However, the Board did not rest its conclusion of obviousness on structural similarity alone. Rather, the Board further recognized that in attempting to predict the biological activities of a drug, a skilled medicinal chemist would not proceed randomly, but would base his attempts on the available knowledge of prior research techniques, and literature used in his field. The prior art showed that one such technique was "bioisosteric replacement" or the theory of bioisosterism--where the substitution of one atom or group of atoms for another atom or group of atoms having similar size, shape and electron density provides molecules having the same type of biological activity. Finding that the Friedman, Burger and Petersen references taught that bioisosterism was commonly used by medicinal chemists prior to 1959 in an effort to design and predict drug activity, the Board concluded that one of ordinary skill in the arts would have been aware of this technique at the time of appellant's invention. [FN8] Further, the Board ***1097** found that Petersen taught as bioisosteric the interchange of the nitrogen and unsaturated carbon atoms--the precise structural difference between imipramine and amitriptyline. [FN9]

> FN8. Appellant submitted the declaration of Dr. Paul N. Craig, an experienced medicinal chemist, JA p. 372. His view was that the concept of bioisosterism could not be used in 1959 to predict the antidepressant effects in amitriptyline or the pharmacological differences between imipramine and amitriptyline. Dr. Craig stated:
> [I]n my opinion "isosterism" in 1959 afforded no basis for predicting the specific pharmaceutical utility in humans, and it is my belief that that is still true today.... I do not believe the carryover of tranquilizing activity from chlorpromazine to chlorprothixene afforded a reasonable basis for predicting the carryover of antidepressant properties from imipramine to amitriptyline.
> Affidavit of Paul N. Craig, JA, pp. 374-75.
> Plainly the Board was not clearly erroneous in discounting that testimony. There was independent evidence in the record to the contrary. The Friedman, Burger and Petersen references recognize that concept as a means of predicting biological properties in isosterically-related compounds prior to 1959.

> FN9. Petersen even went so far as to suggest that the apparent bioisosteric relationship between the interchange of the nitrogen and unsaturated carbon atoms led to the design of chloroprothixene in the expectation that the compound would share the same biological activity as chlorpromazine. *See* Petersen, *supra*, at p. 395.

We see no clear error in the Board's determination as to the teachings of the prior art references, in combination. In view of these teachings, which show a close structural similarity and a similar use (psychotropic drugs) between amitriptyline and imipramine, one of ordinary skill in the medicinal chemical arts, possessed of the knowledge of the investigative techniques used in the field of drug design and pharmacological predictability, would have expected amitriptyline to resemble imipramine in the alleviation of

depression in humans. Accordingly, we agree with the Board that appellant's invention was prima facie obvious over the prior art of record.

[2][3][4] In traversing the Board's decision of obviousness, appellant has urged that the Board's decision was premised on an impermissible "obvious to try" standard. Appellant contends that there was no motivation in the prior art to arrive at appellant's invention. "[O]bvious to try is not the standard of 35 U.S.C. § 103." *In re Antonie*, 559 F.2d 618, 620, 195 USPQ 6, 8 (CCPA 1977) (emphasis omitted). Rather, the test is whether the references, taken as a whole, would have suggested appellant's invention to one of ordinary skill in the medicinal chemical arts at the time the invention was made. *In re Simon*, 461 F.2d 1387, 1390, 174 USPQ 114, 116 (CCPA 1972). Clearly, amitriptyline and imipramine, both known psychotropic drugs, are closely structurally related. The expectation that the similar structures would behave similarly was suggested in the Roche Reports. In combination with those teachings, the prior art teaching that the precise structural difference between amitriptyline and imipramine involves a known bioisosteric replacement provides sufficient basis for the required expectation of success, without resort to hindsight. [FN10] Obviousness does not require absolute predictability. *In re Lamberti*, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976). Only a reasonable expectation that the beneficial result will be achieved is necessary to show obviousness. *In re Longi*, 759 F.2d 887, 897, 225 USPQ 645, 651 (Fed.Cir.1985).

FN10. The teachings of the Roche Reports as well as the Petersen reference distinguish this case from *In re Grabiak*, 769 F.2d 729, 731, 226 USPQ 870, 871 (Fed.Cir.1985) ("there is no motive in the cited art to make the modification required to arrive at appellants' compounds").

[5] We also find untenable appellant's arguments that Petersen teaches away from appellant's invention. Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references. *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). Thus, Petersen must be read, not in isolation, but for what it fairly teaches in combination with the prior art as a whole. That teaching is that the interchange of the nitrogen and the unsaturated carbon atoms is isosteric and compounds so modified are ***1098** expected to possess similar biological properties.

[6] Neither are we persuaded by appellant's contention that the Board erred in relying on the contemporaneous independent invention of others to support its holding of obviousness. [FN11] As we have said earlier, the teachings of the prior art references in combination adequately support the Board's conclusion. However, the additional, although unnecessary, evidence of contemporaneous invention is probative of "the level of knowledge in the art at the time the invention was made." *In re Farrenkopf*, 713 F.2d 714, 720, 219 USPQ 1, 6 (Fed.Cir.1983).

FN11. *Ex Parte Edward L. Engelhardt*, Appeal No. 424-40, *supra* note 1, at pp. 23-24, JA pp. 22(1)-22(m), where the Board indicated that evidence before it revealed that four other groups of inventors independently and contemporaneously discovered amitriptyline's antidepressant properties using reasoning based on a thorough knowledge of investigative techniques, which included the concept of isosterism, used in the medicinal art area.

[7][8] *Unexpected Results:* A prima facie case of obviousness can be rebutted by evidence of unexpected results. *In re Davies*, 475 F.2d 667, 670, 177 USPQ 381, 384 (CCPA 1973). In rebuttal of the PTO's prima facie case appellant has asserted that, as compared to imipramine, amitriptyline unexpectedly has a more potent sedative and a stronger anticholingeric effect. In support of this contention, appellant has relied on an affidavit of Dr. Joseph J. Schildkraut, [FN12] a psychiatrist and a Professor of Psychiatry at Harvard, and also on a published record of a symposium of physicians and psychiatrists concerned with the treatment of the depressed patient. [FN13]

FN12. Affidavit of Joseph J. Schildkraut, JA p. 366.

FN13. Symposium, *Depression Today--Experts Answer Your Questions*, JA p. 309.

Dr. Schildkraut's affidavit recognizes some pharmacological differences between amitriptyline and imipramine including the fact that amitriptyline is a more potent sedative and has a stronger anticholinergic effect than imipramine. Further, Dr. Schildkraut notes that depressed patients have responded differently to amitriptyline and imipramine, some responding to one and not the other or more favorably to one than to the other. For the most part, the record of the cited symposium confirms the differences noted in the Schildkraut affidavit. [FN14] That record also counseled practicing physicians on choosing from the spectrum of tricyclic antidepressants (a term which includes amitriptyline and imipramine) the particular drug useful for an individual patient.

FN14. Dr. Schildkraut was a member of the symposium.

After a careful consideration of all the evidence, we are

persuaded that the Board did not err in determining that the alleged unexpected properties of amitriptyline are not so unexpectedly different from the properties of imipramine, the closest prior art, as to overcome the prima facie showing of obviousness. The prior art of record clearly taught that amitriptyline was a known sedative. [FN15] The evidence before us (which was, of course, before the Board) further revealed that all tricyclic antidepressant drugs, in general, possess the secondary properties of sedative and anticholinergic effects. Specifically, the record showed that during the prosecution of the reissue application, appellant submitted an article entitled "Using the tricyclic antidepressants" which included a table comparing the properties of known tricyclic antidepressant drugs. [FN16] Included in these properties were sedative and anticholinergic effects of the known antidepressants. [FN17] ***1099** Thus, it appears that the alleged difference in properties between amitriptyline and imipramine is a matter of degree rather than kind. Moreover, as to the sedative effects, the article revealed only a slight difference between the two compounds. Amitriptyline was characterized as "highly sedative" while imipramine was only "somewhat less [sedative] than amitriptyline." [FN18] Regarding the anticholinergic effect, the article showed that both drugs have anticholinergic effects but to a different degree. These are not truly unexpected results. The Board found in one of its reissue opinions (incorporated in the reexamination decision now on appeal): "[i]n regard to the sedative and anticholinergic properties of amitriptyline, we are not convinced that the side effects of this material [amitriptyline] are significantly or unexpectedly different from the level of those properties exerted by the closest prior art antidepressant, imipramine." [FN19]

FN15. Rey-Bellet, *supra*, col. 2, line 16.

FN16. *Patient Care*, "Using the Tricyclic Antidepressants," pp. 28-33, 35-36, 39-40, 43-45, 49-52, 57-58, 63-64, 67-68, 71, 73-76, 78, 81, 84-85, (May 15, 1979); *see also* Commission's Appendix, pp. CA 17-45.

FN17. *See also* the Symposium, *Depression Today--Experts Answer Your Questions*, *supra* note 13, at p. 315, where Dr. Hollister indicates that when choosing from the spectrum of tricyclic antidepressant drugs, the choice is based on three pharmacological actions including (1) the amount of sedation (2) the amount of anticholinergic effect and (3) the nature of the drugs in primarily blocking the uptake of serotin or norepinephrine.

FN18. *Patient Care*, "Using the Tricyclic Antidepressants," *supra* note 16, at p. 50.

FN19. *Ex Parte Edward L. Engelhardt*, Appeal No. 480-01, *supra* note 1, at p. 12, JA p. 34.

The core of it is that, while there are some differences in degree between the properties of amitriptyline and imipramine, the compounds expectedly have the same type of biological activity. In the absence of evidence to show that the properties of the compounds differed in such an appreciable degree that the difference was really unexpected, we do not think that the Board erred in its determination that appellant's evidence was insufficient to rebut the prima facie case. The fact that amitriptyline and imipramine, respectively, helped some patients and not others does not appear significant. As noted by the Board, a difference in structure, although slight, would have been expected to produce some difference in activity.

In sum, we hold that the claimed invention would have been obvious to one of ordinary skill in the art. Accordingly, the decision of the Board is

AFFIRMED.

BALDWIN, Circuit Judge, dissenting.

The rejection by the board is flawed because it did not analyze the invention according to the requirement of 35 U.S.C. § 103. The board wrote:

> The issue before us in considering the instant claims on their merits for patentability is whether the artisan having the requisite skill in the pertinent art area and a knowledge of the available prior art would have been motivated to employ amitriptyline in the treatment of human depression.

That is, whether it would have been obvious to try amitriptyline as an antidepressant. Guided by the disclosure of the applicant, the board pieced together information from various patents, journal articles, and papers, and concluded:

> It remains our position that one having ordinary skill in this art are[sic] would have been familiar with the concept of bioisosterism and because of this knowledge would have concluded that the known compound, i.e., amitriptyline, would be *potentially* useful as an antidepressant. [Emphasis ours.]

That is, it would have been obvious to try amitriptyline as an antidepressant. Obvious-to-try is not the test for patentability under 35 U.S.C. § 103. This court and its predecessor, the CCPA, have repeatedly rejected that approach. *In re Goodwin*, 576 F.2d 375, 377, 198 USPQ 1, 3 (CCPA 1978); *In re Antonie*, 559 F.2d 618, 620, 195 USPQ 6, 8 (CCPA 1977); *In re Lindell*, 385 F.2d 453, 455, 155 USPQ 521, 523 (CCPA 1967); *In re Tomlinson*, 363 F.2d 928, 150 USPQ 623 (CCPA 1966); *In re Papesch*, 315 F.2d 381, 137 USPQ 43 (CCPA 1963); *see also In re*

Congress has also rejected that approach by enacting the second sentence of 35 U.S.C. § 103, which states "[p]atentability shall not be negatived by the manner in ***1100** which the invention was made." The reviser's note on this sentence states "it is immaterial whether it resulted from long toil and experimentation or from a flash of genius."

The obvious-to-try analysis is an attack on the method of making an invention that specifically penalizes people in areas of endeavor where advances are won only by great effort and expense. The pharmaceutical field is particularly hard hit because there is an overabundance of structures that are obvious to try. Consider, for example, the Petersen reference which the majority cites to demonstrate the possibility that a nitrogen atom may be replaced by a double-bonded carbon atom. This journal article records an attempt to find drugs useful for the treatment of endogenous psychoses, i.e., tranquilizers. The researchers tested eighteen chemicals with closely related structures. These materials were injected into mice, and compared for their ability to make the mice fall asleep. The results of these tests may be tantalizing and useful, but only as a guide for further research. I agree that, based on this information and the other references cited by the board, the researcher with ordinary skill in the art would be motivated to investigate the possibility of substituting a double-bonded carbon atom for nitrogen. The researcher would also be motivated to test every other structural variation in Petersen, as well as a host of others. Under an obvious-to-try analysis, any of these structures which ultimately is shown to be effective as an antidepressant in human beings would be unpatentable because the researcher dared to follow a logical plan.

The board and the majority also err by reading too much certainty into the teachings of the references. They have not considered the references as a whole. Friedman discusses the phenomenon that compounds with similar chemical structures sometimes behave in a similar fashion in a biological system. Once such a compound has been tested and found to have the same biological activity, it is called "bio-isosteric." [FN1]

> FN1. The term "bio-isosteric" therefore is simply a conclusion drawn after testing. The label is properly limited to the system and purpose for which the compounds were tested. For example, two drugs could be bio- isosteric with respect to making mice fall asleep, and not bio-isosteric when tested at a particular dosage level for the treatment of high blood pressure in human beings. The theory of bio-isosterism as used by the board and majority is nothing more or less than an analysis of structural obviousness.

Friedman also teaches that an isosteric compound "may have the same activity as the original, *or more usually* it may have an *antagonistic* effect." (Emphasis added.) Friedman explains that in order to predict biological activity with accuracy, one ideally should know (1) the mechanism by which the original drug acts and (2) what part of the structure of the original drug is critical to the original drug activity. [FN2] That reference also unequivocally states that comparisons should be made in living systems, but such information is not easily available. That reference relies on *in vitro* testing, and it specifically states that *in vitro* results may or may not correlate with clinical studies. It also clearly states that, for the purposes of its discussion, biological activities such as absorption, distribution, conjugation (detoxification), taste, odor and *side effects of drugs* will be ignored. Friedman concludes that compounds with similar structures need not be bio-isosteric.

> FN2. Neither this reference nor any of the others purport to disclose either piece of information.

The Burger reference does discuss bio-isosterism and its usefulness in designing new drugs. Its evaluation of bio-isosterism as a tool for predicting drug activity is as follows:

> However, if one can achieve a gradual change of biological behavior and follow it accurately at each step of minor structural alteration, one is bound to enhance one property, suppress another, and ultimately arrive at a drug suitable for therapy. Shortcuts to this disconcertingly tedious process have not been found, and this is probably responsible for the still ***1101** prevailing opinion that new useful drugs will be discovered most easily by more or less empirical procedures.

at page 369, and

> Slight stereochemical or structural changes may alter considerably the biological role of a compound. Patient variation of at least a reasonable number of structures is still the only answer to this question.

at page 370.

The Roche reports contain background information about various pharmacological effects of amitriptyline. The information was derived from testing for its toxicity and tranquilizing effect on animals. This information would be essential to a decision to clinically test the drug. It is not sufficient to show the drug would be useful for treating human beings. Congress gave pragmatic recognition to the difficulty of determining whether a new drug is useful by its enactment of the 1962 amendment to 21 U.S.C. § 321. That action was taken in response to problems caused by another tranquilizer, thalidomide.

Neither these references, nor the other references cited by

the board and the majority purport to teach the worker with ordinary skill in the art that amitriptyline is a drug that is useful for treating depression in human beings. That conclusion is steps removed from the information presented by these sources. I would reverse.

800 F.2d 1091, 55 USLW 2236, 231 U.S.P.Q. 375

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[1] The question presented by the appeal is a very simple one and, although counsel have managed to pile up more than 400 pages of record and 80 pages of brief, we think it can be dealt with in a very few paragraphs. The question is simply whether "Wander," applied to a drug used chiefly in the treatment of tuberculosis, is likely to cause confusion with "Warner," used for a wide range of pharmaceuticals. The Assistant Commissioner decided that it was not. We agree.

Warner has used its trademark extensively since 1920, has spent large sums on advertising and enjoys a very valuable goodwill, symbolized by the mark which has acquired a secondary meaning in the field of pharmaceuticals. Wander has used its trademark (which was, in fact, the surname of the founder of the business) since 1951 for the tuberculosis remedy, known as "P.A.S." These facts were taken into consideration by the Assistant Commissioner in reaching her decision as appears from her opinion.

The appellant complains of a number of errors on the part of the Assistant Commissioner, the chief ones being that the conclusions reached by her as to the connotations of the words were not supported by enough evidence [1] but were intuitive or subjective. We think that her conclusions would have been proper had there been no evidence at all. It did not require evidence to enable the Assistant Commissioner to conclude that Wander is a common word and unlikely to create a surname impression and that Warner, although having a common meaning, albeit one seldom met with, creates the impression of being a surname.

[2] In determining whether a likelihood of confusion exists between trademarks "the judgment of the eye and ear is more satisfactory than evidence from any other source." Glenmore Distilleries Co. v. National D. Prod. Corp., 23 F.Supp. 928, 931, 39 USPQ 65, 69 (E.D. Va.) (affirmed, 101 F.2d 479, 40 USPQ 264 (C.A. 4th)). See Liggett & Myers Tobacco Co. v. Finzer, 128 U.S. 182. These two marks perhaps look somewhat alike but not enough to be confusingly similar, and they do not sound alike. Both parties direct their advertising entirely to physicians and pharmacists—a highly intelligent and discriminating public. The evidence presented fell far short of overcoming the "judgment of the eye and ear."

Affirmed.

[1] As one authority for this proposition the appellant cited General Shoe Corp. v. Lerner Bros. Mfg. Co., Inc., 45 CCPA 872, 254 F.2d 154, 117 USPQ 281. If that opinion be read, it will be seen that the reason why the Commissioner was reversed was that he had relied on too much evidence.

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47 CCPA 1142

Court of Customs and Patent Appeals

In re LUNDBERG AND ZUSCHLAG

Appl. No. 6571 Decided July 20, 1960

PATENTS

1. Prior adjudication—Applications for patent (§ 56.05)

In reviewing rejection of claims of continuation application on ground of res judicata based on rejection of claims in parent application, starting point is a comparison of what is claimed in applications; if claimed subject matter is the same, the prior adjudication is binding; if differences appear, court looks to their nature and significance; if difference is one which would not be obvious to one of ordinary skill in the art, the prior adjudication is not a ground for rejection; the difference is between previously adjudicated claims and appealed claims, not between appealed claims and prior art; patentability over prior art is not reconsidered as a virgin problem; on the contrary, prior decision stands, right or wrong, for all disputed issues there decided, and court determines patentability of new claim over adjudicated claim, considering prior art, if necessary, only if sustantial differences between claims exist; public policy which is implemented by this rule is that there shall be an end to litigation, that when one has exhausted remedies provided by law he shall not be permitted to go through the process all over again.

2. Prior adjudication—Applications for patent (§ 56.05)

In cases appealed to Court of Customs and Patent Appeals, or taken to District of Columbia courts under 35 U.S.C. 145, involving ex parte prosecution of patent applications, what must be borne in mind with respect to res judicata is distinction between claims to different inventions and different claims to same invention; where different inventions are claimed, res judicata does not preclude a new consideration but, where applicant is merely presenting new claims to same invention, the patentability of which he has already argued before court, reconsideration of issue of patentability is proscribed by res judicata.

3. Construction of specification and claims—Introductory phrase (§ 22.55)

Statement in claim that apparatus is "for determining the existence, location, outline and depth of sought for mineral deposits in the earth" is no more than a preamble, is but the object or purpose of the apparatus, does not define structure, and cannot be relied on to differentiate claim from rejected claim in parent application.

Particular patents—Geophysical Exploration

Lundberg and Zuschlag, Apparatus for and Method of Geophysical Exploration, claims 1 to 11 of application refused.

Appeal from Board of Appeals of the Patent Office.

Application for patent of Hans T. F. Lundberg and Theodore Zuschlag, Deceased, by Johanna Zuschlag, Administratrix, Serial No. 523,784, filed July 22, 1955; Patent Office Division 48. From decision rejecting claims 1 to 11, applicants appeal. Affirmed.

See also 94 USPQ 73, 113 USPQ 530.

E. CLARKSON SEWARD, New York, N. Y., for appellants.

CLARENCE W. MOORE (D. KREIDER of counsel) for Commissioner of Patents.

Before WORLEY, Chief Judge, RICH, MARTIN, and SMITH, Associate Judges, and KIRKPATRICK, Judge.*

RICH, Judge.

This appeal is from the affirmance by the Patent Office Board of Appeals of the examiner's rejection of claims 1-11, all of the claims of appellant's application No. 523,784, filed July 22, 1955 for "Apparatus for and Method of Geophysical Exploration."

The application at bar is stated to be a continuation of application No. 2885, filed January 17, 1948 as a division of application No. 561,436, filed November 1, 1944.

Application No. 2885 was before this court with respect to claims 51 and 54-58 thereof, the rejection of which was affirmed in In re Lundberg et al., 44 CCPA 909, 244 F.2d 543, 113 USPQ 530 (decided in 1957). Application No. 561,436 was also before this court in In re Lundberg et al., 39 CCPA 971, 197 F.2d 336, 94 USPQ 73 (decided in 1952), wherein the rejection of claims 99-116 of that application was affirmed. (The last-mentioned application is said to have matured into Patent No. 2,636,924.)

The instant application, being filed as a continuation of one which had been prosecuted (as was its parent) through appeal to this court, was treated as "special" and reached its final rejection by the examiner on the second action in less than five months from its filing, following what appellants admitted was an "effective" pendency of over ten years, qualified by the assertion that the claims here are "new claims drawn in accordance with the express permission of the new Patent Act * * * presented for fresh consideration in compliance with the salutary changes made by the new Act for the benefit of inventors."

As is apparent from the fact that the instant application is a "continuation" of No. 2885, the invention *disclosed* in the application here on appeal is the identical invention which was before this court in the second Lundberg et al. case, supra, decided in 1957.

The claimed invention here, as in the former case, relates broadly to aerial geophysical exploration for the purpose of determining, by detection and measurement of anomalies in the earth's magnetic field, the existence, location, outline, and depth of sought for mineral deposits in the earth. All appealed claims except 3 and 5 are directed to apparatus and those two claim a method. Whichever way the invention is defined, it is practiced by carrying through the air above the terrain being examined, means for detecting and measuring a component of the magnetic fields encountered, while automatically stabilizing said means with respect to level and orientation, recording the measurements made, relating them to the terrain, and interpreting the results.

In the prior appeals we affirmed rejections of the claims as unpatentable over prior art. In the present case claims 1-11 are likewise rejected on prior art but additionally they all stand rejected on the ground of res judicata [1]

* United States Senior Judge for the Eastern District of Pennsylvania, designated to participate in place of Judge O'CONNELL, pursuant to provisions of Section 294(d), Title 28, United States Code.

[1] In view of the consistent use by the examiner, the board, and the appellants (but not the Patent Office Solicitor) of the expression res adjudicata, attention is directed to the following from Black's Law Dictionary, 3rd Ed.:

> Res adjudicata. A common but indefensible misspelling of res judicata. The latter term designates a point or question or subject-matter which was in controversey or dispute and has been authoritatively and finally settled by the decision of a court. Res adjudicata (if there be such a term) could only mean an article or subject of property "awarded to" a given person by the

by reason of the later of our two prior decisions, supra. Claims 1-5 (all of those initially presented) were so rejected on the first action, the next and final action so rejected all claims, and the board affirmed this rejection, citing In re Ellis, 24 CCPA 759, 86 F.2d 412, 31 USPQ 380. It also affirmed the rejection on prior art. We will consider first the issue involving res judicata.

[1] The starting point is a comparison of what is claimed here *with the relevant claims in the prior case*. If the claimed subject matter is the same, the prior adjudication is binding; if differences appear, then we look to their nature and significance. If the difference is one which would not be obvious to one of ordinary skill in the art, the prior adjudication is certainly not a ground for rejection. But, we repeat, the difference is between the previously adjudicated claims and the appealed claims, not between the present claims and the prior art. We emphasize this in view of appellant's effort to ge a de novo consideration on the basis of the prior art alone, a contention implicit in the following excerpt from appellants' brief:

> This last named ground [res judicata] seems to Appellants to be practically moot because, if this Court agrees that some or all of the claims are patentable, the holding of res adjudicata [sic] is eliminated; while if all the claims are held to be unpatentable, the said ground is superflous.

And again:

> * * * the holding of res adjudicata [sic] is subservient to the holding of patentability.

Patentability over prior art is not reconsidered as a virgin problem. On the contrary, the prior decision stands, right or wrong, for all disputed issues there decided, In re Prutton, 40 CCPA 975, 980, 204 F.2d 291, 295, 97 USPQ 447, 450, and we determine patentability of the new claim *over the adjudicated claim*, considering prior art, if necessary, only if substantial differences between the claims exist. The public policy which is implemented by this rule is that there shall be an end to litigation, that when one has exhausted the remedies provided by law he shall not be permitted to go through the process all over again. Appellants' brief shows no awareness of this legal principle in repeatedly "urgently requesting" us to review our former holdings and revaluate the references in the light of the new claims.

[2] In cases appealed to this court, or taken to the District of Columbia courts under 35 U.S.C. 145, involving the ex parte prosecution of patent applications what must be borne in mind with respect to res judicata is the distinction between claims to different inventions on the one hand and different claims to the same invention on the other. Where different inventions are claimed, res judicata does not preclude a new consideration; but where an applicant is merely presenting new claims to the same invention, the patentability of which he has already argued before the court, reconsideration of the issue of patentability is proscribed by the doctrine of res judicata.

Turning now to the appealed claims, claim 1 is the appartus claim on which dependent claims 2 and 6-11 are based and is like claim 4 except for differences which will be pointed out later. Claim 1 reads:

> 1. Apparatus for geophysical exploration from the air *for determining the existence, location, outline and depth of sought for mineral deposits in the earth* comprising, the combination with a maneuverable airplane adapted to transport an operating crew and the hereinafter recited equipment, of means carried thereby for detecting and measuring while in the air with a precision sensitivity capability of one gamma or less at least one component of magnetic fields related to such deposits, operatively connected means for automatically stabilizing said detecting and measuring means in relation to level and orientation for maintaining its detecting and measuring sensitivty regardless of motions of the airplane, and means operatively connected with the detecting and measuring means for automatically and simultaneously making a record of the measurements as they occur. [Emphasis ours.]

Claim 54 of application No. 2885 before us in Lundberg et al., 44 CCPA 909, 113 USPQ at 531-532, supra, reads as follows:

> 54. Apparatus for geophysical exploration from the air comprising, the combination with a maneuvable airplane adapted to transport an operating crew and the hereinafter recited equipment, of a magnetic detecting instrument carried by the airplane and adapted while in the air automatically to receive and respond to with a sensitivity of one gamma or less magnetic effects of earth anomalies related to mineral deposits, a support for said detecting instrument carried by the airplane in operative association with the detecting instrument and adapted automatically to stabilize the latter in relation to level and orientation regardless of motions of the airplane, and a record making device also carried by the airplane in operative association with the detecting instrument and adapted simultaneously to make a record of the said effects of the said anomalies to which the detecting instrument responds.

[3] It is clear that these two claims define the same combination of airplane detecting and measuring means, stabilizing means, and recording means albeit the language is changed. The principal difference presented to us appellants as having significance is the italicized passage in claim 1, it being argued that this is "a definite limitation, rather than a mere introductory preamble, because it directly *specifies the apparatus claimed* which comprises the thereafter recited elements." We are unimpressed by this contention. It is clearly no more than a preamble, is but the *object or purpose of* the apparatus, does not define structure and, as the Patent Office solicitor pointed out, is implicit in the words "for geophysical exploration." It cannot be relied on to differentiate claim 1 from claim 54. Appellants similarly argue about several other less evident changes in verbiage which we have carefully considered but the distinctions are even more tenuous and we see no need to discuss them. The claims speak for themselves. We find the same invention is being claimed in claim 1 as was claimed in claim 54.

Claim 4 differs from claim 1 in omitting the airplane as a positive element of the combination while using the preamble "Apparatus for aerial flight magnetic geophysical exploration for determining" etc. Appellants point to other differences from claim 1, an example being that "this claim refers to 'magnetic fields *indicative* of such deposits' instead of merely saying '*related* to such deposits'." It is clear to us that it is in the same class as claim 1, a claim to the same invention in substance as claim 54 of No. 2885, though broader with respect to the means for achieving "aerial flight" and perhaps somewhat narrower in some other respects.

Claims 3 and 5 are to a method of magnetic geophysical exploration using the apparatus broadly defined in claim 1 and differ from each other much as claims 1 and 4 differ, claim 3 exploring "from an airplane" while claim 5 calls for "aerial flight" exploration. Claim 3 reads:

> 3. A method of magnetic geophysical exploration from an airplane for mineral deposits in the earth which includes the following steps: flying through the air above the terrain being explored means for automatically detecting and measuring with a precision sensitivity capability of one gamma or less at least one component of the magnetic field or fields encountered while automatically stabilizing the said detecting and measuring means in relation to level and orientation against motions of the airplane and simultaneously making a record of the measurements; identifying for desired subsequent operations the area or areas indicated by the record as containing a sought for deposit or deposits; and interpreting the record for determining the location, outline and depth of the deposit or deposits.

Claim 55 in the appeal on application No. 2885 reads:

> 55. A method of geophysical exploration from a maneuverable airplane which includes the following steps: transporting by such an airplane over an area under investigation an operating crew and magnetic detecting equipment capable of automatically receiving and responding to with a sensitivity of one gamma or less effects of earth anomalies related to mineral deposits, such as changes in the earth's magnetic field or a magnetic field artificially created in the earth; automatically stablizing said detecting equipment in relation to level and orientation during transportation regardless of motions of the transporting airplane; automatically making a record of the said effects of such anomalies which the detecting equipment receives and to which it responds as it responds thereto; identifying for subsequent examination the terrain indicated by the said received and recorded effects as containing such anomalies; and geophysically interpreting the record thus obtained.

We are unable to see how a reading of these claims can lead to any other conclusion than that they define substantially the same invention. Aside from pointing out that the same arguments apply as those made with respect to claim 1, all appellants do here is point to such immaterial differences as that between identifying the "area" containing a deposit (claim 3) and identifying the "terrain" containing the anomalies (claim 55), asking us to reconsider patentability over the art because of such differences. Appellants have had their day in court on this method and are not entitled to such reconsideration.

Apparatus claims 2 and 6-10 depend from claim 1, adding thereto progressively limitations to a "permeability bridge" as the "detecting and measuring" means recited in claim 1 and various details of that bridge. Claim 2

judgment of a court, which might perhaps be the case in replevin and similar actions.

calls for "a permeability bridge" broadly without further limitation, claim 6 for an "alternating current-direct current permeability bridge" and claims 7-10 depend each from the preceeding claim, adding further details. Claim 7 reads:

> 7. Apparatus as defined in claim 6, in which the permeability bridge includes *at least one* pick-up *coil having a core composed of* highly permeable *material* that is extremely sensitive to magnetic variations and resists change in its operative characteristics when exposed to mechanical vibrations and thermic and barometric fluctuations, *such as nichrome*. [Emphasis ours.]

Claim 51 in application No. 2885, previously adjudicated, reads:

> 51. Apparatus as defined in claim 54, in which the detecting instrument is provided with *at least one coil having a core composed of metal* which is not only extremely sensitive to variations in intensity of natural or artificially created magnetic fields but is also strongly resistive to change in its operative characteristics when exposed to mechanical vibrations, thermal variations, or barometric fluctuations, *such as nichrome*. [Emphasis ours.]

The supporting disclosure behind both of these claims is, of course, identical since we are dealing with a continuing application and is, in part, as follows:

> This detecting or investigating mechanism may be defined as an alternating current-direct current permeability bridge similar to that described in United States patent to Theodore Zuschlag No. 1,896,737, dated February 7, 1933. This instrument or mechanism is based upon a magnetic effect set up in a nichrome wire, or its equivalent, which is used as a core in a coil energized by an alternating current simultaneously exposed to the effects of a direct current generated in a substantially uniform field being investigated.

Zuschlag patent No. 1,896,737 discloses a Wheatstone bridge network for detecting magnetic field fluctuations which occur in the magnetic testing of rails or the like, the bridge containing a pair of coils with ferro-magnetic cores, which the instant as well as the prior application suggests may be nichrome.

Claims 2 and 6 fall with claim 7 since they are simply intermediate claims 1 and 7 in scope. Claims 8, 9 and 10 merely add, successively to claim 7, connection to a source of alternating current for energizing the coil or coils, means for adjusting the field strength affecting the pick-up cores and the independent adjustment thereof. Appellants make no argument as to these last three claims, as distinguished from the others, merely pointing out that they add "more and more details." Perforce, since Zuschlag is relied upon by appellant as the sole support for the specific limitations of the bridge recited in claims 2 and 6-10, Zuschlag is also prior art for these same limitations. However, one must still decide whether res judicata prevents reexamination of the patentability of the cambination. Claim 51 in our prior case included, as the detector, a coil having a specific type of core. This is the same coil and core detector which appellant now recites as merely included in a permeability bridge circuit, or a permeability bridge circuit the details of which were known to one skilled in the art. The bridge and single core perform identical functions in the combination, each measuring magnetic field variations in the same manner, any differences in sensitivity apparently depending only on the details of the detector itself and not on the combination. We are therefore of the opinion that res judicata is controlling insofar as claims 2 and 6-10 are for the *same invention* as the claims in the prior case (the use of a coil and core detector). Insofar as they differ by merely progressively decreasing in scope by including obvious features shown by Zuschlag, they are hereby held to be unpatentable over the prior adjudicated invention.

Claim 11 depends from claim 1 and reads:

> 11. Apparatus as defined in claim 1, in which the detecting and measuring means includes a plurality of magnetrons, a main field coil coaxially surrounding and operatively connected with each magnetron, an auxiliary field coil coaxially positioned with respect to and operatively connected in opposition to each main coil, and a record making device operatively connected with the magnetrons.

The feature of claim 11 is the use of the defined magnetron circuit as the "detecting and measuring" means which is one element of the combination broadly defined in claim 1, including a *plurality* of magnetrons, associated main field coils and an auxiliary field coil related in a particular way to each main coil. The "record making device" would appear to be the "means for automatically and simultaneously making a record" of claim 1 (which has its counterpart in claim 54 of No. 2885) with the requirement that it be "connected with the magnetrons."

In the prior case application No. 2885 also had claims to magnetron circuits as follows:

> 57. Apparatus as defined in claim 54, in which the detecting instrument includes *at least one magnetron* together with *a control coil operatively connected thereto* and means for supplying electric current to the control coil. [Emphasis ours.]
>
> 58. Apparatus as defined in claim 57, which also includes an *auxiliary feedback coil* connected in opposition to the control coil. [Emphasis ours.]

Examination of claim 58, including the subject matter of claim 57 on which it is dependent, reveals that it differs from claim 11 in the instant case only as respects the use of a "plurality of magnetrons" as opposed to "at least one" and in the coaxial positioning of the two coils associated with each magnetron. In our opinion on application No. 2885, as to claims 57 and 58 this court said, 113 USPQ at 536-537:

> As aforesaid, the "Physical Review" article discloses the general adaptation of magnetron circuits to the measurement and detection of magnetic fields. Also, we have previously pointed out that the Hull reference fairly suggests the use of a magnetometer of a sensitivity of one gamma for use as the detecting instrument. It would be obvious to one skilled in the art, in view of the foregoing, to substitute a magnetron for the magnetometer detecting instrument of Hull.

* * *

With reference to claim 58, the board stated that the use of feedback members in electrical circuits is well known. Appellants have failed to question the accuracy of said statement by requesting that it be supported by an affidavit under Patent Office Rule 107 and did not present any evidence to contradict it. Therefore we are constrained to accept it as true. In re Lewis, 25 CCPA 1273, 96 F.2d 1009, 37 USPQ 786. In view of this fact, we fail to see that it would be inventive to use a feedback coil in conjunction with a conventional magnetron coil as broadly recited in claim 58. The rejection of claim 58 is accordingly sustained.

The holdings on these disputed issues were necessary to our finding that the claims in the prior case were unpatentable and res judicata precludes a reexamination of those prior holdings.

In Hall's "Physical Review" article (one of the references in both this and the prior case) the magnetron control coil is described as "a solenoid wound around the magnetron," and is also illustrated as coaxial with the magnetron. In positioning the auxiliary as well as the main field coil, one skilled in the art would coaxially position the windings and the magnetron to obtain the proper effect on the electron beam in the magnetron. The use broadly of a "plurality of magnetrons," as called for by claim 11, without limitation as to positioning or specific circuit connections is clearly suggested by the prior art bridge circuits which incorporate a plurality of magnetometers in the various arms of a balanced bridge circuit. Claim 11 is unpatentable because insofar as it would require a reexamination of the identical issues raised in the prior case, because of inclusion of the same subject-matter as the prior claims, res judicata controls and insofar as it differs from the claims previously adjudicated we hold that those differences are only such as would be obvious and hence unpatentable.

With respect to appellants' general allegation that they were entitled to have their application passed on according to the law as set forth in the Patent Act of 1952, our review convinces us that the applications have been so treated at all times subsequent to the effective date of that act. The applications formerly before us were certainly so treated in this court. However, we did not always agree with appellants on the construction of various provisions of that act, nor do we now.

The decision of the board is *affirmed*.

. . . nevertheless, (the inventor would) be entitled to have his patent construed with reference to that unspoken advantage since the patentee is entitled to the benefit of every function within the scope of the claims and actually possessed by his mechanisms, even if he does not know of it at the time of the patenting . . . no obligation rests upon the patentee to turn his specification into a trade circular.

Or as Judge Buffington said in the language previously quoted from Mead-Morrison Mfg. Co. v. Exeter Machine Works, supra,

The gist of a disclosure is that it be so full as will enable those versed in the art to thereafter use the device and where such use, practice, mechanism, formula, etc. are fully disclosed, the requirements of the law are satisfied, without claiming every advantage such device may have. If subsequent use discloses unsuspected additional benefits the patentee is the gainer during the life of the patent, and the public when it expires.

*Stanley D. Schwartz**

RES JUDICATA AS APPLIED IN PATENT OFFICE PROSECUTION & PATENT ENFORCEMENT LITIGATION

Introduction

The topic of res judicata, as applied to patent enforcement litigation and Patent Office proceedings, has long been, and continues to be, a subject of much interest. The President's Commission, which has recently concluded a study on the United States Patent System, has resulted in a proposal, to Congress, that the traditional notions of res judicata, as now applied in patent infringement suits, be relaxed. Such a relaxation of the rigid rules of res judicata has already been achieved in administrative proceedings before the U.S. Patent Office.

It is the purpose of this paper to examine the status of res judicata both in administrative proceedings before the Patent Office and in patent enforcement litigation. It is an object of this paper to show how the law of res judicata has reached a degree of certainty in proceedings before the Patent Office, although application of res judicata principles in patent enforcement litigation is still in the developing stage. The direction and scope of these principles will be most important to the patent owner and the public at large. It is, therefore, a further object of this paper to suggest a direction that Congress may take, in order to maximize the interests of both the public, in general, and business, in particular, while at the same time protecting the legitimate interests of the patentee.

Traditional Notions of Res Judicata and Collateral Estoppel

Res judicata,[1] under current usage, has been used to describe the effects of various types of judgments. Res

* Examiner, Group 160.

[1] For a general discussion of res judicata and collateral estoppel, see 1 B Moore, Federal Practice § .401-.488 (Fed. 1965); *Developments in the Law—Res Judicata*, 65 Harv. L. Rev. 818 (1952).

judicata and its variants all seek to provide the element of finality to judicial determinations and an end to litigation between parties. This may be accomplished by considering the former judgment as a "bar" or "merger" where the subsequent action proceeds on all, or part, of the very cause of action which was the subject of the first action. This aspect of the doctrine of res judicata, sometimes called res judicata by bar or merger, differs from the second aspect of res judicata, estoppel by judgment. If the second action is upon a different claim or demand, an estoppel by judgment, more limited in its scope than res judicata by bar, operates as an estoppel only as to those matters upon which a determination or final verdict was actually rendered.[2]

Under the doctrine of res judicata, a valid, final and prior adjudication rendered on the merits of a cause of action or claim, can bar relitigation by parties or their privies, of the same claim or cause of action, the judgment in the prior action operates as an absolute bar to relitigation, not only of those matters actually litigated in the prior suit, but also any other matter which might have been acted upon in the prior suit.

Under the Federal Rules of Civil Procedure[3] the doctrine of res judicata is given a more rigid application because all possible theories of relief can be included under one claim. This is unlike the various code systems wherein there is a very strict theory of pleading which results in a more liberal application of res judicata.[4]

Although a party may be precluded from relitigating a particular claim, under the rules of res judicata, a litigant is afforded a wide range of protection from a judgment. In the proper case, a judgment may be vacated

[2] Cromwell v. County of Sac, 94 U.S. 351 (1876). This case provides an excellent discussion as to the distinctions between res judicata by bar and estoppel or by judgment or collateral estoppel. (See P. 550—James on Civil Procedure). This distinction has been confirmed and restated by the Supreme Court in Tait v. Western Md. Ry., 289 U.S. 620, 623(19); Commissioner v. Sunnen, 333 U.S. 591, 597 (1948).

[3] Fed. R. Civ. P. 8(a).

[4] See James, *supra* note 1 at 553-557.

or amended by direct or collateral attack.[5] For example, a litigating party may seek to be relieved from the unjust effects of a "void" judgment.[6] A judgment may also be reopened by a motion for a new trial[7] or may be altered or amended by a motion to alter or amend the judgment[8] or for newly discovered evidence, "which by due diligence could not have been discovered in time to move for a new trial under Rule 59(b)."[9]

Under the doctrine of collateral estoppel,[10] where there is a different claim or cause of action commenced, and the same issues were tried and previously determined, they cannot be litigated again.[11] Where collateral estoppel is involved between the same parties as in the original suit, the one who claims its benefits must show that the very fact or point in issue was, in the former action, litigated by the parties, determined by the court, and the determination of the matter or point must have been necessary to the result.[12]

Rulings of law, divorced from the facts to which they are applied, do not become binding upon the parties under the principle of res judicata, although rulings upon the legal consequences of specific facts are entitled to collateral estoppel effect equally with findings of fact.[13]

Res Judicata in Administrative Proceedings[14]

As Professor Davis succinctly notes:

> the reasons against a second litigation between the same parties of the same claim or issues are precisely the same for some ad-

[5] See 1 B Moore, 13, § 0.405(1), at 622; see also James, *supra* note 1, at 532-49.

[6] Fed. R. Civ. P. 60(b) provides that a motion to vacate a judgment on the ground that it is void must be "made within a reasonable time."

[7] Fed. R. Civ. P. 59(a)-(d).

[8] Fed. R. Civ. P. 59(e).

[9] Fed. R. Civ. P. 60(b)(2).

[10] See, in general, Scott, *Collateral Estoppel by Judgment*, 56 Harv. L. Rev. 1 (1942); Polasky, *Collateral Estoppel—Effects of Prior Litigation* 39 Iowa L. Rev. 217 (1954).

[11] Cromwell v. County of Sac, *supra* note 2, at 353.

[12] Polasky, *supra*, at 222.

[13] Commissioner of Internal Revenue v. Sunnen, *supra* note 2.

[14] Holton. *The Doctrine of Res Judicata in Ex Parte Patent Practice—Prototype for a Liberal Approach*, 10 Rutgers Law Review, 716 (1956).

ministrative determinations as they are for most judicial determinations. The sound view is therefore to use the doctrine of res judicata when the reasons for it are present in full force, to modify it when modification is needed, and to reject it when the reasons against it outweigh those in its favor.[15]

This view of res judicata in the administrative process has also been shared by many courts. In one such case[16] the Court noted:

> While the rules that govern the finality and conclusiveness of adjudications at the common law do not apply, in the strict sense, to administrative or quasi-judicial action in the Executive Departments of Government, yet in administrative action as well as in judicial proceedings, it is both expedient and necessary that there should be an end of controversy. . . . In what we have said we do not desire it to be understood that the Patent Office may not, if it thinks proper so to do, entertain and adjudicate a second application for a patent after the first application has been rejected. What we decide is that it is not incumbent upon the office as a duty to entertain such applications.

Whenever the traditional doctrine of res judicata does not work well, when applied to particular administrative actions, it may be qualified or relaxed, depending on the particular problems involved. Professor Davis notes that the doctrine should be applied in full force, where the particular agency deals in "past facts."[17]

Res Judicata in Ex Parte Patent Office Proceedings

A. *The Requirements of a Final Appellate Decision of the Earlier Case.*

Res judicata, as applied in the United States Patent Office, is a more "relaxed" form of the traditional manner in which res judicata is utilized. The Court of Customs and Patent Appeals (C.C.P.A.), as well as the Board of Appeals of the Patent Office, have relaxed the requirements of the applicability of res judicata so as not to frustrate the patent laws regarding patent prosecution.

[15] Davis, Administrative Law, p. 327.
[16] *In re* Baratt's Appeal, 14 App. D. C. 255 (1899).
[17] Davis, *op. cit. supra* note 14, at 329.

The applicability of res judicata to ex parte proceedings has become somewhat more uniform due to several recent pronouncements by the CCPA.[18] In the ex parte prosecution of a patent application, where an applicant is given a final rejection on his application, he has a choice of two alternative methods of continuing his application in order to secure a patent: he may either appeal the final rejection of the Examiner to the Patent Office Board of Appeals,[19] or he may file a second application.[20] If the applicant chooses the latter course of action, the applicant is given another opportunity to correct a statutorily insufficient disclosure[21] or to disclose a utility as required under 35 U.S.C. 101, etc.

The C.C.P.A. has commented that the application of res judicata to an unappealed final rejection seems to be a

> particularly inappropriate means for achieving the normal goals of the res judicata doctrine, i.e., reliability and finality of judgments, and conservation of judicial time and energy. . . . [The] Patent Office practice abounds with procedures which afford applicant every opportunity to secure the full protection to which he is lawfully entitled. Often, the filing of a continuation or a continuation-in-part results in a *fresh approach* to and an effective reconsideration of the same issue. In many ways, application is at variance with the entire concept of continuing applications.
>
> With regard to the goal of conserving the time of administrative and judicial tribunals, res judicata rejections would seem to have exactly the opposite effect. For if unappealed final rejections are uniformly held to be res judicata, the applicant has no choice other than appeal or abandonment of his case. But if time and energy are to be expended, even unnecessarily, it is much more desirable that such expenditure should occur at administrative levels. On balance, we believe that an applicant should be encouraged in, rather than penalized for, promptly

[18] *In re* Hitchings 342 F.2d 80, 144 U.S.P.Q. 637 (C.C.P.A. 1965); Application of *In re* Szwarc 319 F.2d 277, 138 U.S.P.Q. 208 (C.C.P.A. 1963); *In re* Fried, 312 F.2d 930, 144 U.S.P.Q. 639 (C.C.P.A. 1963).
[19] 35 U.S.C. 134 (1964).
[20] In order to maintain the filing date of the first application, the applicant may file a continuation application (U.S. Manual of Patent Examining Procedure, § 201.07 (ed. 1961) (hereinafter cited as M.P.E.P.) or a continuation-in-part application (M.P.E.P. § 201.08)).
[21] See 35 U.S.C. 112 for the requirements of a patent application.

ground of rejection of the first application and its statutory basis must be examined and compared with the ground of rejection and its statutory basis in the second application. Thus, where new matter is introduced in the second application, to overcome the deficiency in the first application, a rejection based on res judicata would be improper because the issues in the two cases are different. In the first case, the issue involved the sufficiency of the disclosure that must comply with the statutory requirements of 35 U.S.C. 112.[31] In the subsequent application, the issue is whether the claims are entitled to the benefit of the earlier filing date of the parent application. In order to have the benefit of the earlier filing date,[32] the invention must be sufficiently disclosed in the parent application so as to comply with section 112.[33]

In the filing of a continuation-in-part, the applicant may be desirous of introducing claims which are narrowed in scope, and which are adequately supported by the disclosure of the parent application. For example, in *In re* Fried,[34] parent application had a generic claim reading "any lower alkyl group" which was held to be based on an insufficient disclosure. In the subsequently filed continuation-in-part, the applicant narrowed the claims to read "methyl group," for which there was adequate support in the parent application. Although the Court said "different claims" were presented, it is not enough to say that there is a different claim presented. In actuality, two different issues were present. In the first case, the issue involved the sufficiency of disclosure under section 112,[35] whereas the issue in the second case involved was one of continuity between filing dates (i.e., did the second case have the benefit of the earlier filing date?).[36]

The Court, in *Fried*,[37] provides an unfortunate example of a mechanical case illustrating the inequity which results if res judicata is used where the prior adjudication was based on claims in the parent case which are broader than the claims presented in the continuation application. Actually, in mechanical cases, unlike chemical cases, *more* disclosure is required to support the more narrow claims, as compared to the generic claims in chemical cases. Therefore, it is possible for the same type of inequity to occur when the broader claims are presented in the continuing application.[38] The Court, in *Kollsman* v. *Ladd*,[39] further stated "that the doctrine of res judicata, or more properly, collateral estoppel, is inapplicable where there are *different claims* rejected on a *different basis* in the continuation application. . . ."[40] This purely mechanical test used by the District Court does not logically answer the question of whether the issues are different. The important question that must be answered before res judicata can be applied, is: whether the disclosure in the parent case is sufficient to support the claims in the continuation-in-part? If there is support, then the claims of the continuation-in-part case will have the benefit of the earlier filing date. If there

[31] 35 U.S.C. 112 states in part: "The specification shall contain a written description of the invention, and of the manner and process of making and using it such *full, clear, concise,* and *exact* terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention." (Emphasis added)

[32] 35 U.S.C. 120 (1964 ed.).

[33] Section 201.11 of the MPEP is also directed to preventing the addition of new matter to supply the deficiency in those cases where the earlier filing date is sought, and this provides the conditions that must be met before an earlier date can be obtained. The second application "must be an application for a patent for an *invention* which is also *disclosed* in the first application." M.P.E.P. 201.11 (emphasis added)

[34] *In re* Fried, *supra* note 17.

[35] See note 31, *supra.*

[36] See note 82, *supra.*

[37] See note 17 *supra*, at 932, n. 3.

[38] Kollsman v. Ladd, 140 USPQ 309 (D.D.C. 1964). The reasoning of the Court in Fried, that although the broad claims of the parent case may be based on an insufficient disclosure, the more narrow claims are likely to find support in the disclosure of the parent case and thus have the benefit of the earlier filing date. This same reasoning does not apply in the reverse situation, where the narrow claims of the parent case as based on an insufficient disclosure, in a mechanical case, because the disclosure would usually encompass claims of a broader scope.

[39] *Ibid.*

[40] *Id.*, at 188.

is no support in the parent case, it may be argued that there is no new issue presented.[41]

Collateral estoppel applies not only to the same claim, or substantially the same claim, but also the claims which present nothing patentably different from the previous claim.[42] In *Lundberg*, the Court held that res judicata will be held where there are differences in the claimed subject matter (i.e., between the previously adjudicated claims and the appealed claims), and such differences are obvious modifications which may be shown by prior art.[43] However, a Board of Appeals decision held that res judicata will not apply where the utility disclosed in the later application differs from that of the former application even though the claims in the two cases are the same.[44]

[41] In Kollsman, the rejection was not on a different basis, but rather involved a determination as to whether the claims of the continuation-in-part (C.I.P.) had sufficient support in the parent case so that the "C.I.P." would have the benefit of the earlier filing date of the parent case.

[42] *In re* Ellis, 1937 C.D. 153 (C.C.P.A. 1937); *In re* Prutton, 97 U.S.P.Q. 447 (C.C.P.A. 1953); *In re* Lundberg et al., 126 USPQ 412 (C.C.P.A. 1960). *In re* Hellbaum, 152 U.S.P.Q. 571 (C.C.P.A. 1967); *Ex parte* Boukidis, 154 U.S.P.Q. 444 (P.O. Bd. App. 1967).

[43] *Id.*

[44] *Ex parte* Schott, 136 USPQ 383 (P.O. Bd. App. 1962). In this case, the Board reversed the res judicata rejection and held that although the claims in the later case were to "precisely the same physical structure," the previous application disclosed its use as a calculating device, whereas the later application disclosed that the device is useful as an instrument for teaching principles of the decimal system, and thus a different issue of patentability was present. The Board said (note at 385) ". . . a prior adjudication should not be considered as binding or be followed when passing upon the same claim where a different question of patentability is presented for adjudication because of new evidence or new issues." (Emphasis added) In *Ex parte* Budde 150 USPQ 469 (P.O. Bd. App. 1966) the Board felt the language used by the Board in Schott was too broad and thus held that applicant could not present new evidence to show unobviousness. The Board reasoned that the additional evidence merely supports applicant's argument in the original appeal, and no new issue (i.e., a new utility) was presented, as in Schott. However in the recent case of *In re* Herr, 153 USPQ 548 (C.C.P.A. 1967), the Court held that res judicata is inapplicable where the applicant presents additional evidence of patentability not presented in the parent case. The court stated. . . "Granted the instant parties and claims are *identical* with those of the parent Herr application and, in a *broad* sense, the issue in the original appeal was, as here, whether those claims were allowable in view of the prior art. More to the point, however, the precise issue in the prior Herr appeal was whether appellant was entitled to the allowance of his claims in the *application* and *record then* on appeal. The precise issue here is whether appellant has legally established his right to those claims in the *application* and *record now* before us."

As a result of recent decisions, the application of principles of res judicata have been considerably relaxed and a degree of stability has been added to ex parte practice.

Res Judicata in Patent Infringement Litigation

According to the doctrine of mutuality of estoppel, in order for a judgment to be binding, the estoppel of the judgment must ordinarily be mutual (the conventional doctrine recognizes some exceptions).[45] Thus a party to a subsequent suit who attempts to utilize either the doctrine of res judicata or collateral estoppel must have been a party, or a privy, to the prior suit,[46] and would also have been bound by the prior judgment had the outcome of the prior suit been opposite.

The doctrine has been the subject of much criticism in recent years and has been departed from, in a recent case,[47] because the rule "runs counter to the salutary public policy that there be a definite end to litigation when a party has had a full, free and untrammeled opportunity to present all facts pertinent to a controversy and to be heard thereon."[48] Critics of the rule desire making collateral estoppel available to those who were not parties to the first action against one who was such a party. Such a result would not be unfair because the one against whom the judgment is invoked would have had the opportunity to litigate the very issue upon which he will be bound.

On the other hand, proponents of the mutuality rule (i.e., a more limited estoppel), believe that a party is

[45] See, e.g., 1 Freeman, Judgments, § 428 (5th ed. 1925).

[46] 1 B Moore, *supra* note 13, § 0.412.

[47] Currie, *Mutuality of Collateral Estoppel: Limits of the Bernhard Doctrine*, 9 Stan. L. Rev. 281 (1957), and his later article, *Civil Procedure: The Tempest Brews*, 53 Calif. L. Rev. 25, 38-46 (1965) wherein the decisions are collected and analyzed. Bernhard v. Bank of America National Trust & Savings Association, 19 Cal. 2d 807, 122 P.2d 892 (1942); Bruszewski v. United States, 181 F.2d 419 (3rd Cir., 1950); Zdanok v. Glidden Co., 327 F.2d 944 (2nd Cir., 1964), cert-denied, 377 U.S. 934.

[48] Nickerson v. Pep Boys—Manny, Moe & Jack, 247 F. Supp. 221, 148 USPQ 125, 126 (D. Del. 1965).

entitled to his day in court on each issue against each potential adversary.[49] The doctrine also seeks to protect a litigant from the harassment and expense of having to repeat his defense on an issue already decided. Furthermore, the doctrine also stabilizes legal relationships by not subjecting the same parties to conflicting decisions, as well as putting an end to controversies between two litigants.[50]

In the typical patent suit, the patentee may enforce his patent[51] in a civil action for infringement[52] against the alleged infringer.[53] Once the question of infringement and validity has been finally adjudicated, the doctrines of res judicata and collateral estoppel will preclude the same parties from relitigating the same issues.[54]

Where the parties are different, however, the courts commonly apply the general rule of mutuality. In *Triplett* v. *Lowell*,[55] the Court held that an adjudication adverse to a claim in a patent does not preclude another suit upon the same claim against a different defendant. The Court stated:

> Neither reason nor authority supports the contention that an adjudication adverse to any or all the claims of a patent precludes another suit upon the same claims against a different defendant. While the earlier decision may be given great weight in a later litigation and thus persuade the court to render a like decree, it is not res adjudicata (sic) and may not be pleaded as a defense.[56]

[49] James, *supra* note 1, at 597-599 (1965); Note, *Res Judicata With Reference to Persons Neither Parties nor Privies—Two California Cases*, 57 Har. L. Rev. 98, 105 (1943).

[50] See the recent case, Technograph Printed Circuits, Ltd. v. United States, F.2d, 153 U.S.P.Q. 298, 303-04 (Ct. Cl., 1967), where the Court refused to allow a defendant-infringer to utilize the estoppel defense.

[51] See 35 U.S.C. 281-293 (1964).

[52] 35 U.S.C. 281 (1964).

[53] Under 35 U.S.C. 271(a), the patentee is given the right to exclude all others from making, using, and selling, the claimed invention. Where such an action is brought, the defendant will usually set up a defense of invalidity of the patent. Most patents are held invalid because the intention was obvious to one of ordinary skill in the art, at the time of the invention. 35 U.S.C. 103.

[54] Plymouth Rubber Company, Inc., v. Minnesota Mining and Manufacturing Co., 267 F.2d 443, 125 U.S.P.Q. 508 (D. Mass. 1960).

[55] 297 U.S. 638 (1935).

Since the Supreme Court's affirmation of the mutuality rule in *Triplett* v. *Lowell*[57] in patent-validity litigation, the courts of appeals and district courts have continued to follow, with only one exception,[58] the rule set down in *Triplett*.[59] Courts have reasoned that "a stranger to a previous patent suit is neither harassed, put to additional expense, nor compelled to relitigate an issue, and there is no danger of being victimized by inconsistent decisions."[60] As a result, the mutuality rule should be maintained, and a patent which has been adjudged invalid may be litigated ad infinitum. However, there are more important factors in the public interest which *must* be considered before a conclusion can be drawn as to the status of the mutuality rule in validity litigation. Concern for the broader public problems is essential.

In Aghnides v. Holden,[61] Judge Schnackenberg commented:

[56] *Id.* at 642, *c.f.* Nickerson, *supra* note 47, at 222, where the Court criticized the Triplett decision as not resting on a solid foundation, primarily because the Court cited two decisions, Mast, Fova, & Co. v. Stover Mfg. Co. 177 U.S. 485 (1900) and Santary Refr. Co. v. Winters, 280 U.S. 30, 35 (1929), both of which deal with comity, and not res judicata or collateral estoppel.

[57] *Ibid.*

[58] Nickerson, *supra* note 48.

[59] See, e.g., Automatic Radio Mfg. Co. v. Hazeltine Research, Inc., 176 F.2d 799, 808, 82 USPQ 324, 332 (1st Cir. 1949), aff'd 339 U.S. 827, 85 USPQ 378 (1950); Tatko Bros. Slate Co. v. Hannon, 122 USPQ 585, 586 (2nd Cir., 1959), *cert. denied*, 361 U.S. 915, 123 USPQ 591; Urguhart v. Commissioner, Internal Revenue Service, 102 USPQ 427, 429 (3 Cir. 1954); S. H. Kress & Co. v. Aghnides, 113 USPQ 395, 396-97 (4 Cir., 1957); Bros Inc. v. W. E. Grace Mfg. Co. 147 USPQ 1 (5th Cir., 1966); Gordon Johnson Co. v. Hunt, F. Supp., 96 USPQ 92 (D.N. Ohio, 1952); Technograph Printed Circuits, Ltd. v. Methode Electronics Inc., 148 USPQ 181 (7th Cir., 1966); John Deere Co. of Kansas City v. Graham, 142 USPQ 243 (8th Cir., 1965); Abington Textile Machinery Works v. Carding Specialists Ltd., 148 USPQ 33 (D.D.C. 1966).

[60] Technograph Printed Circuits, Ltd. v. United States, *supra* note 49, at 304.

[61] 226 F.2d 949, 107 USPQ 195 (7th Cir., 1955).

[62] It has been estimated that the minimum cost of conducting a patent infringement suit is about $50,000 for each side. Gorn, "Economic Value of Patents," The Encyclopedia of Patent Practice and Invention Management.

I believe . . . he (the patentee) is entitled under existing law to another day in court where he might litigate the same issues upon which he lost in the Goodrie case. . . . He . . . may litigate and relitigate again and again the questions of validity of his patent as long as he selects a different defendant in each of the infringement suits which he files. . . . It is a situation which is particularly abhorrent when considered against the backlog of untried cases which clog our Federal Courts. The latter are cases where the litigant asks only for his day in court, not for a plurality of days in court as Aghnides is entitled to under existing law. The remedy is not in our hands. The Congress by legislation could grant relief.

Because the patentee is able to constantly relitigate his patent, there is a shocking waste of time and effort in in order to have a reconsideration of the same references and same contentions in court after court, in the determination of the validity of the patent. A patentee should not have to litigate the validity of his patent all over again each time he sues a different infringer in a different circuit.

Not only does the patentee's right to relitigate contribute to a heavy backlog of cases in the Federal District Courts, but it may also unjustly subject a defendant-infringer to unusually high litigation costs.[62] It is quite expensive to determine validity under present law because the infringer is never quite sure what date of invention the patentee can prove, nor what date of invention can be proved for some reference art.

Another factor which causes the patentee to continually relitigate his patent in various circuits is the uncertainty as to a ruling on validity. For example, where suits are filed against infringers, all in different circuits, it seems quite illogical how there could be more than one conclusion on the question of validity, because the patent is the *same* in every case, and the defendant has access

[62] *Supra* note 58. In this case, no less than ten prior decisions are tabulated which has occupied the attention of no less than twenty-five Judges in the Fifth, Sixth, and Eighth Circuits. Such judicial conflict may be attributed to differing judicial interpretations, for example, what is public use under 35 U.S.C. 102(b)? Compare Picard v. United Aircraft, 128 F.2d 632, 635, (2nd Cir., 1942) with Gayler v. Wilder, 51 U.S. 477 (1850).

to the *same* prior art in each case. An example of such judicial conflict can be seen in *Bros Incorporated* v. *W. E. Grace Manufacturing Company et al.*[63] Despite possible conflicts in statutory interpretations, there are some circuits where no patents are upheld in contrast with some circuits which have a high percentage of patents held valid. Some judges are noted to have consistently held patents valid over a period of years while another judge in the same district has found every patent to be invalid, with one exception.[64]

An attempt to alleviate the problems of delay, uncertainty, and the great expense, would necessitate our abandonment of a strict adherence to the mutuality of estoppel doctrine. The above considerations warrant our rejection of the doctrine.

There have been proposals made that a holding of invalidity should be *in rem* (i.e., a theory of unilateral estoppel).[65] Proponents of *in rem* invalidity maintain that:

after a patent owner has had full opportunity to say everything he could say in support of his patent, there is no reason why he should have an opportunity to re-try the issue just because he can find and pursue a different infringer. That he could get a better expert or a better lawyer or a different Judge the second time is no sufficient reason. . .

Besides, if the second case should uphold the patent, the second infringer would be subject to the patent and also be in competi-

[63] A district judge in Texas has held in favor of the patentee in over 50 percent of the patent cases tried in his court over a period of ten years. During an equal period, the federal court in New Jersey has held patents invalid in 85 percent of the cases tried. Such figures as these indicate the substantial difference in attitudes of the courts. "An Analysis of Patent Litigation Statistics," Staff Report of the Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary, U.S. Senate (Gov't Printing Office, 1961).

[64] Section 294 of S. 1042, 90th Cong. 1st Sess. (1967), provides that any final adjudication in a Federal Court adverse to the validity or scope of a patent claim constitutes an estoppel against the patentee and those in privity with him. Any claim held invalid would be cancelled from the patent. See also Proposal XXIII, Report of the President's Commission on the Patent System.

[65] Report of Meeting of Council and Committee Chairmen, Woodward, Section of Patent, Trademark, and Copyright Law, American Bar Association, Feb 4-5, 966. See also, *President Commission Report*, at 39; Wright. *U. S. Patent System and the Judiciary*, 47 J.P.O.S. 727.

tion with the first infringer who can legally disregard the patent.[66]

It has been suggested that the above proposal is one-sided and works only against the patent owner, thus diminishing the ability of the patent system to furnish an incentive. To avoid this, it has been suggested that the patentee be required to give public notice of a fully *in rem* determination on validity six months prior to the commencing of an infringement suit, so anyone can come in and contest the validity of the patent.[67] The effect of such a determination would be conclusive against all. To be effective, such a proposal would require an extension of the class action concept [68] as well as the rules governing service of process.[69]

In rem validity, in whatever form it may exist, still provides for many evils. For example, where a patent has consistently been held valid, a subsequent holding of invalidity by a state court, or in a federal court where a judge is totally unfamiliar with the protection of intellectual property, and the application of the patent laws to the various technologies [70] would be harsh and unjust to the patentee. Furthermore, *in rem* validity would encourage a more intensified forum shopping [71] which would take the form of studying the decisions of the various Federal Courts of Appeal and the opinions of particular judges in selecting the judicial district which would be most favorable to commence an action (i.e., for patent infringement or an action for declaratory judgment).

[66] See American Bar Association proceedings, Section of Patent, Trademark, and Copyright Law, Section XXIII (1967).

[68] Fed. R. Civ. P. 23.

[69] Fed. R. Civ. P. 69.

[70] See Soans, *"The Courts—Our Number One Problem"* 9 Idea 639 (1966). This short article discusses the reason why judges have acquired a negative attitude toward patents.

[71] It would be to the patentee's advantage to commence a patent infringement suit in a circuit and district which appear to be favorable to patents. The patentee's choice of forum is limited under the special venue statute [28 U.S.C. 1400(b)] to the district of the defendant's residence or incorporation or to any district where the defendant has committeed an act of infringement and maintains a regular and established place of business. The potential defendant has a much wider choice of forum under 28 U.S.C

Judge Arthur M. Smith, of the Court of Customs and Patent Appeals, suggests the establishment of a specialized, Article III, Court of Patent Appeals,[72] consisting of a panel of qualified patent judges, and transfer to it the appellate jurisdiction (involving issues of patent infringement), as well as the jurisdiction in the CCPA and the Court of Appeal for the District of Columbia.[73] Many reasons have been set forth in support of such a proposal.[74] Some of these are: (1) it would reduce the duration and cost of litigation, (2) it would lessen the volume of litigation, (3) it would enable uniform interpretation of the law, (4) the judges for this court would be specialists in the application of patent law, (5) greater certainty as to rights of inventors and interest of the public because the court's decision is effective throughout the United States.[75]

The proposal for a court of patent appeals has also been the subject of much criticism. It has been argued that such a court would place an undue burden of expense on litigants because of the great traveling expenses.[76] Such a court would also tend to channelize the patent law into its own peculiar lines divorced from the development of the law as a whole.[77] This would be

1391. Thus a party threatened with an infringement sent by a corporation will frequently commence an action for declaratory judgment of invalidity and noninfringement in a circuit and district regarded as hostile toward patents.

[72] For a history of the bills presented to Congress to establish a court of patent appeals, see Conway, *Single Court of Patent Appeals—A Legislative History*, Report of the Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary, U.S. Senate (Gov't. Printing Office, 1959).

[73] See chapter 13, 35 U.S.C. (1964). See also Conway, *op. cit. supra* note 72.

[74] Conway, *supra* note 72, at 32-33.

[75] See also, Reynolds, *In Favor of a Single Court of Patent Appeals*, 13 JPOS 596 (1931), Rice, *A Court of Patent Appeals*, 17 J.P.O.S. 18 (1935); Brown, *The Situation Confronting Our Patent System*, 31 J.P.O.S. 159, 180 (1939); Zugelter, *Suggestions for Some Improvement in our Patent System*, 23 JPOS 62 (1941); Woodward, *Patents and Administrative Law*, 55 Harv. L. Rev. 950, 960 (1942).

[76] See Meroni, *Comments and Observation Concerning Recommendations in Report of the National Patent Planning Commission*, 26 JPOS 117, 125 (1944); Lane, *Why a Single Court of Patent Appeals is not Necessary*, 13 J.P.O.S. 569 (1931).

[77] "I think it might be desirable to have one court of patent appeals provided, with this proviso, and I for myself would regard it as absolutely

most unhealthy because license agreements are essentially contracts, an infringement is essentially a trespass, patent rights are a species of property rights, proof in patent litigation follows the rules of evidence, etc.[78] Also, patent cases frequently involve questions of other areas of the law such as unfair competition, antitrust law, trademarks, copyrights, and contract law. It would seem unsound to channel all these questions to a single court especially where some of these questions are controlled by local law.[79] In addition, such a proposal may run counter to the belief that patent controversies may best be handled by a nonspecialized judiciary.[80]

It has been suggested by Judge Smith that the appointment of specialized judges to the various federal district courts and courts of appeals throughout the ten circuits, so that the other members of the bench can be guided and assisted by those who know something of the patent law field and its problems.[81]

The need for such specialists was recognized long ago by Judge Learned Hand:[82]

> I cannot stop without calling attention to the extraordinary condition of the law which makes it possible for a man without any knowledge of even the rudiments of chemistry to pass on such questions as these. . . . In Germany . . . the court summons technical judges to whom technical questions are submitted and

critical, that is, that it should be a rotating court. I do not want to have a court of specialists, because we all get in love with ourselves." Parke Davis & Co. v. H. K. Mulford Co., 189 F. 95, 132 (Hand). See also Rifkind, *A Special Court for Patent Litigation? The Danger of a Specialized Judiciary*, 37 A.B.A. Jour. 425 (1951) wherein the author maintains that "in time such a body of law, secluded from the rest, develops a jargon of its own thought patterns which are unique, internal policies which it subserves and sometimes at odds with the policies pursued by the general law."

[78] Rifkind, *supra* note 77.

[79] See Frost, "*The Patent System and the Modern Economy*," Report of The Subcommittee on Patents, Trademarks, and Copyrights, of the Committee on the Judiciary, U.S. Senate (Gov't. Printing Office, 1957).

[80] Wright, *U.S. Patent System and the Judiciary*, 47 J.P.O.S. 727, at 732 (1965).

[81] Smith, "*Specialized Patent Judges*, American Bar Association, Section of Patent, Trademark and Copyright law, at 84 (1966). See also, American Patent Law Association, Report of the Special Committee to Study the Patent System, at 12 (1966).

[82] Parke Davis & Co. v. H. K. Mulford Co., *supra* note 77, at 115.

> who can intelligently pass upon the issues without blindly groping among testimony upon matters wholly out of their ken.

This proposal overlooks the reason for such an appointment of specialized judges to the bench. It is not because of the ordinary judge's lack of knowledge of patent law, but rather because of his specialty in a particular technology. The main disadvantages of such a scheme are two-fold. There is always the risk that the "patent member" of a court of appeals panel would tend to dominate patent decisions even though he may only have a minority voice. Furthermore, the expert will not be an expert in all technical areas. If the judge is a mechanical engineer, he might be very helpful in interpreting the claims of a mechanical case. However, he may be of little help in the understanding of the claims of a chemical invention.

Among other proposals which have been the subject of much discussion and debate include: (a) technical assistants be assigned to the various federal courts,[83] (b) separate determination of validity of a patent by a tribunal of technically qualified patent specialists in the executive branch of the judicial branch in an adversary proceeding instituted by the patentee or any other person. The effect of such a decision would be *in rem*.[84]

The above proposals will help reduce, to an extent, the problems of litigation costs, repetitive nature of patent litigation, and the great uncertainty associated with patent litigation. However, the proposals discussed above will have other harmful effects on the judiciary and the patent system as a whole. It is felt, therefore, that an alternative proposal should be made.

It is hereby proposed that where a patentee's claims are held invalid by a court of competent jurisdiction, the patentee may either disclaim the invalid claims [i.e. by

[83] Whinery, *The Role of the Court Expert in Patent Litigation*, Study of the Subcommittee on Patent Trademarks, and Copyrights of the Committee on the Judiciary, U.S. Senate (Gov't. Printing Office, 1958). A study of the function of a neutral expert in patent litigation is presented in great depth.

[84] Section of Patent, Trademark, and Copyright Law, American Bar Association (1966) at page 46.

terminal disclaimer, 25 U.S.C. §253 (1964)] or he may proceed against another infringer within a reasonable time. In the event the claims are *again* held invalid, the plaintiff will be held liable, except under exceptional circumstances, for both litigation costs,[85] as well as reasonable attorney's fees.[86]

This provision would constitute a logical extension of the present statute where "the court in *exceptional cases* may award reasonable attorney's fees to the prevailing party.[87] This statute has been employed by courts, on a limited basis, where there has been a gross injustice to an alleged infringer.[88] One of the objects of the proposal is to discourage vexatious and unjustified litigation and should be invoked when, and only when, such is clearly shown.[89]

The proposal will be consistent with past legislative policy against permitting recovery of attorney's fees as the ordinary thing in patent suits. Furthermore, the proposal is entirely consistent with recent judicial developments which preclude a patentee from asserting his rights contrary to public interest.[90]

The legal effect of such a statutory provision would merely raise a presumption that the patentee's conduct

[85] 28 U.S.C. 1920 provides for items comprising costs. A judge or clerk of any court of the United States may tax as costs the following:
(1) fees of the clerk and marshall
(2) fees of court reporters for all or any part of the stenographic transcript necessarily obtained for use in the case
(3) fees and disbursements for printing and witnesses
(4) fees for exemplification and copies of paper necessarily obtained for use in the case
(5) docket fees 1923 of title 28

[86] See Tidewater v. Kitchen, 152 U.S.P.Q. 36 (4th Cir., 1967) when a similar application of the proposal is considered.

[87] 35 U.S.C. § 285 (1964) (Emphasis added).

[88] Fees have been awarded where the conduct of the party is characterized as unfair or vexatious or involving bad faith or some other equitable consideration which makes it unjust that that prevailing party should be left to bear the burden of his counsel fees. See Plymouth Rubler Co. v. Minnesota Mining & Mfg. Co., 133 U.S.P.Q. 173, 177 (D. Mass. 1962).

[89] It is not contemplated that the recovery of attorney's fees will become an ordinary thing in patent suits,.... The provision is also made general so as to enable the court to prevent a gross injustice to an alleged infringer." 1946 U.S. Code Congressional Service, 1386, 1387.

[90] See e.g., Mercoid Corp. v. Mid-Continent Inv. Co., 320 U.S. 661 (1944); Edward Katzinger Co. v. Chicago Metallic Mfg. Co., 329 U.S. 394 (1947); Morton Salt Co. v. G. S. Suppiger Co., 314 U.S. 488 (1942).

in commencing the action against the infringer is unjust. The patentee would then have the burden to show the good faith of this action against the infringer in order to destroy the presumption. The net effect of this provision is to discourage one from continually relitigating his patent rights against alleged infringers which contributes to the great backlog of patent infringement suits. Such a provision would also materially reduce the evils that would arise if any of the above discussed proposals were to be adopted. It is essential that Congress act now because the fact remains that unless, and until, the present law is changed, patent litigation will continue to be subject to repetitious patent suits, and unnecessary litigation costs, in addition to the great burden on the judicial machinery to handle the great backlog of cases.